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During the summer months, Farmer's Digest is mailed to you every 45 to 50 days instead of monthly. This practice, started years ago, keeps our subscription rates down by giving you fewer copies when you have less time to read. You will receive our August-September issue on or about August 15. October and other following issues will again arrive near the first of the publication month.

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THE HIGHSMITH COMPANY
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The Farmer's Digest

Volume 23 June - July 1959 Number 2

The Brew That Is Shaking The Cattle Business

Artificial meat tenderizers are the big news in the meat business. This "story behind the news" tells you what tenderizers can mean to the beef industry . .

Condensed from
The Progressive Farmer

C. G. Scruggs

AN innocent looking milky-like juice from a tree of the subtropics of India and South America has set off a chain reaction that is likely to shake up the cattle business more than any other single development since refrigeration.

This shakeup is in the making because of a simple truth that is demonstrated by millions in meat markets every day—people want above all else, *tender meat!*

Most men talk in glowing terms of carcass conformation, marbling, grades, etc. Beef breeders and feeders worry about rates of gain, breeds, hair color, etc. Yet, housewives don't care about any of them. They, and the millions in their families, worry about three things most of all in beef—*they want it tender, they want it lean, and they want it cheap.*

Extensive consumer surveys prove these facts conclusively. *Artificial tenderizers for the first time make these goals of meat eaters a real possibility.*

The universal tenderizer up till now has been the meat grinder. To a smaller extent in the past, long feeding plus aging of carcass in coolers has produced meat that was more tender. But, neith-

Reprinted by permission from The Progressive Farmer, Birmingham 2, Alabama

er feeding nor aging could assure tender meat all the time.

The whole field of artificial tenderizers broke loose in the late forties when a company called Adolph's started selling a tenderizer made from the secretion of the papaya tree. Since then there have been several other tenderizers developed and put on the market.

Here's what wide use of artificial tenderizers could do:

1. Cut feeding of cattle.
2. Make much of so-called cheap part of a carcass, or lower grade meat, available as steaks.
3. Shift emphasis in cattle breeding to fast growth on pastures with less emphasis on long feeding.
4. Bring about standardization and cheaper processing of meats.
5. Better serve the meat eater by assuring him that every piece of meat he buys will be tender.
6. Provide cheaper meat.

You would expect tenderizers to be magic to offer the possibilities they do. They aren't, however. Tenderizers—or enzymes—make meat more tender by breaking down the meat muscle fibers and connective tissues. Some people may worry about what tenderizers do to the taste. The chances are good that if you've eaten steak in a restaurant recently, you have eaten an artificially tenderized piece of meat —particularly if it costs less than $1.50.

Meat packers and other institutions are already using 20,000 gallons of tenderizers a month—enough to tenderize 7 to 8 million steaks. Taste offers very little problem. In fact, a whole chain of restaurants has sprung up based on the use of tenderized steaks and is growing by leaps and bounds. They sell a steak, baked potato, and salad for $1.99.

D. B. Love, manager of Armour & Company frosted meats division, says their sales of tenderized steaks have doubled in the past year. The story is the same at other major packers.

A new brand of thinking provides a Mud Room in new homes. Seems like the greatest invention since the Back Hall.

The USDA has O.K.'d tenderizers for use only on meat that is quick frozen. Tenderized steaks aren't in grocery stores yet. Thousands of housewives buy tenderizer and put it on the meat at home.

But some opposition to use of tenderizers has sprung up. The North Carolina Board of Agriculture will not permit use of tenderizers on meat processed in that state. Yet, packers have found no consumer resistance.

The big boom in tenderized meat will come—not in top-

quality cuts or grades of beef — but in so-called cheaper cuts of beef and lower grades. Armour Company officials say, "Good grade is about the stopping point." Above that, aging carcasses still pays.

It's estimated now that only 22% of a beef carcass is suitable for steak. Tenderizer will step this percentage up. Tenderizer makers say that low-cost chuck and round steak, which weren't considered too good for broiling, now can be broiled easily and taste good after tenderizing. Cow loins, once slow sale items, are now moving fast—mostly because of tenderizers.

The University of Florida and other institutions are studying possibilities of injecting enzymes in live animals just before slaughter to get tenderization. Texas A. & M. and other colleges are studying possibilities of selecting and breeding cattle for tenderness.

What does this mean to beef cattlemen? *It could be the biggest break yet for Southern crossbred grass-fat cattle.* Because of breeding and the long-standing idea that grass beef is tough, Southern beef cattle are often knocked down in price. If tenderizers are used as widely as estimated, the roadblocks to Southern beef cattle may be knocked out.

Size of Lambs Determined by Ewes

Size of a yearling ewe before first breeding is a good indication of how large her lambs will be, both at birth and at weaning time.

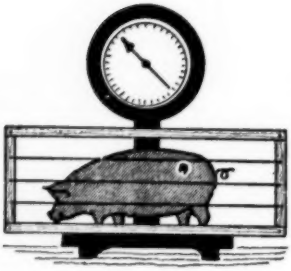
Purdue University animal scientists say that tests at the United States Department of Agriculture's southwestern range and sheep breeding laboratory at Fort Wingate, N. M., show that heavier ewes—regardless of breed—produce heavier, faster-growing lambs than lightweight ewes.

Quicker profits from breeding flocks should be possible as a result of this finding, say the USDA scientists, because culling can be done before breeding—rather than after each ewe has produced a lamb. In addition, the bigger ewes have more skin area for growing wool.

In the four-year USDA tests, ewes were grouped by weight. The lightest group averaged 65.4 pounds as yearlings and the heaviest, 92.7 pounds. The heaviest group, with an average weight advantage of 27.3 pounds, produced lambs averaging 1.29 pounds more at birth and 10.5 pounds more at weaning.

—Purdue University

Which Breeds for Crossing?



Here's a capsule rating of both American and European breeds with suggested crosses to fit the way you raise hogs.

Condensed from Farm Journal

Dean C. Wolf

JUST about everyone agrees that crossbreeding pays off in market hog production. But which breeds should you use? And where do the European breeds, such as Landrace and Yorkshire, fit in?

Hog men got help on both questions at Iowa State College's recent swine production conference.

"Select breeds on how they 'nick' and on how they fit your housing and management," suggested L. N. Hazel, breeding specialist.

European breeds that are popular in this country have the advantage in litter size, mothering ability, feed efficiency and length. But American breeds are more rugged, less susceptible to respiratory troubles, and generally do better under poorer housing and management conditions.

Crossing the two will give you maximum hybrid vigor, says Hazel. How much you should use European breeds, however, depends mainly on how you raise hogs. Here's how he figures it:

For a well-managed confinement system, use boars of two European breeds and two American breeds, alternating them in a 4-way rotational crossing program. Save crossbred gilts for replacements.

In a confinement system where housing or management is not quite so good, drop down to one European breed with two American breeds or go to four American breeds. Some of the things that put stress on the European breeds are a larger number of different size pigs in the same pen, not enough feeder space and poorly ventilated housing.

In a well-managed pasture system, use a European breed between two American breeds.

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"The good mothering ability of the European breeds makes up for what they lack in ruggedness and ability to forage," Hazel explains.

If hogs rough it on poor pasture, glean cornfields or pick up behind cattle, use only American breeds in a 3- or 4-way cross.

"You can find exceptions to the breed averages," Hazel points out. *"It's more important how good a boar is as an individual and how good his test records are, than what breed he is."*

Some breeds are improving faster than others, too. Hazel cited the Hampshire for its great improvement in carcass quality the last five years. As a result, Hamps are gaining the fastest in use on farms. And the Hamp is the ruggedest breed of all.

	Rate of Gain	Feed Efficiency	Carcass	Litter Size	Mothering Ability
Berk	average	average	excellent (good muscling)	small	poor
Chester	average	average	poor (too fat)	good	best of American breeds
Duroc	excellent	best of American breeds	poor (small loin eye)	best of American breeds	good
Hamp.	average	little below average	good (heavy loin)	average	good
Poland	below average	below average	good (heavy ham)	small	average
Landrace	excellent	excellent	average (long loin, small eye)	large	excellent
Tam	below average	below average	poor (lack muscling)	average	good
York	fair	excellent	average (long loin, small eye)	biggest of all breeds	excellent

The strong points of one can be used to correct the weak points of another, in selecting breeds for crossing. The chart shows how Hazel sizes them up. It's based upon extensive experience with the eight different breeds both on farms and in college experiment stations, and on performance in testing stations.

Yorkshires have made considerable improvement in growth rate, and Landrace in percentage of lean cuts. Both breeds lack ruggedness, but the York is more

susceptible to respiratory troubles under poor management.

The York and Landrace can add length to the shorter breeds, such as Polands, Chesters and Durocs. Polands have extremely meaty carcasses and cross very well with all the other breeds.

Other news from Iowa State's swine day program:

Fresh feed improved gains 13% and feed efficiency 5% during the starter period, compared with the same formula pelleted and stored for six months. It appears that feeds lose palatability, and possibly some nutrient kick, in storage.

A new antibiotic called Oleandomycin (Pfizer) looks promising. In a 28-day trial beginning with pigs weaned at 2 weeks of age, the antibiotic boosted gains 32% to 44% and improved feed efficiency 20%, depending on level. When added to a grower ration that the pigs received from 29 to 78 pounds, it improved gain 8.6% and cut feed requirements 8 per cent.

Copper sulphate at the rate of 2 pounds per ton of feed boosted daily gain 9% and reduced feed required by 4.6% with pigs from 33 pounds to 94 pounds.

Enclosed, insulated, heated and ventilated houses may pay for finishing hogs in cold weather. Preliminary tests indicate it may be cheaper than the extra feed it takes to keep pigs warm.

The Iowa Staters figure annual costs for insulation, heating and ventilating at $1.17 per pig, if you depreciate the equipment over a ten-year period, and maintain the temperature at 40 to 50 degrees for finishing hogs. It may save $5.62 worth of feed per pig.

"It looks like you could get twice the return from an acre of grass if you burned it in a furnace during the winter than by pasturing pigs on it during the summer," T. E. Hazen told the hog men.

Lighter hog weights will help the price situation. Selling at 220-lb. instead of 270-lb. can make a big difference in the tonnage of pork on the market. And on a declining market, holding hogs is a poor market for corn. Suppose you hold a 220-lb. hog an extra month until it hits 270. That hog probably would bring 2c per lb. less. If it took 4 bu. of corn to put on the extra 50 lbs., a farmer would have shoveled corn for a month to get only 77c per bu. for his work. And the price drop may be more than 2c!

—*High Dollar Farming*

Cold Facts On A Hot Subject

Is field hay pelleting or wafering equipment just around the corner . . ?

Condensed from The Furrow

Burt S. Horne, Pennsylvania State University

MANY farmers are optimistically waiting for a wafering or pelleting machine that will cut standing alfalfa, squeeze out the moisture, pelletize or wafer it, and load it into a wagon. They may have a long wait.

Many engineering obstacles confront the designers of such a haymaking machine. It must have sufficient capacity, low power requirements, and be priced where the average farmer can afford to own and operate it.

In other words, a practical field wafering machine will become a reality when the following requirements are met. It must handle long hay directly from the windrow and produce wafers at a rate of 5 to 6 tons per hour, using a power unit of not over 50 h.p. It should have a total weight of not more than 4,000 pounds and cost not over $4,000. It must, of course, be a one-man outfit.

I do not think such a machine will be available in the near future. Certainly no such machine is available today. We should anticipate, of course, that many of these engineering problems will be solved some day. After all, many manufacturers, experiment stations, and universities are conducting research on wafering equipment.

When a machine is designed and massproduced to meet the needs of most farmers, I believe that wafering will be as commonplace as baling is now. In the meantime, we still have this year's hay crop to make; also next year's and others beyond that.

Many farmers have not taken advantage yet of the hay equipment now on the market. It is already possible for one man to mow, condition, rake, bale and store his own hay. With modern

Reprinted by permission from The Furrow, Moline, Illinois

drying equipment, it's even possible for one man to handle crops in 8 to 10 hours—a single working day.

Today's modern baler makes bales in any size desired. The trend is to half-sized bales automatically tossed into a trailing wagon, thus eliminating the costly, hard work of loading. Elevator and conveyor equipment delivers these bales into the mow without stacking. This is equipment that the average farmer can purchase today at reasonable cost, with ample capacity, and with low power requirements.

If full use is made of the modern equipment already available, farmers can make top-quality hay the one-man way.

Hens that Lay Two Eggs a Day Are on the Way

Strains of hens that will lay two eggs a day will eventually be developed, said Dr. W. P. Blount in an address at Totnes, Devon, England, when he discussed future trends.

An expansion of the numbers of hybrids laying standard-size eggs and with a low feed intake would displace many of the established heavy breeds and their crosses.

The present swing towards hen batteries would continue until broodiness had been eliminated from many strains. Later there would be a swing back to deep litter. Communal-type nest boxes would be replaced by better roll-away nests.

More strains would be discovered with resistance to such diseases as fowl paralysis and nephritis. Special balanced layers, rations for stock on deep litter would be given. In future layers' rations would probably contain only vegetable proteins, which would make manufacture cheaper.

Dr. Blount, speaking on turkeys, said that a small, white, high egg production bird for the housewife's trade, and a larger, Broad Breasted Bronze, requiring artificial insemination, for the hotel trade, appeared likely.

As all-the-year-round breeding would take over, greater use of deep freeze would be necessary. To obtain regular supplies of hatching eggs, breeding stock would require controlled environments.

Liquid freezing might displace blast freezing at processing stations. Cut-up joints would appear since housewives did not always require a whole turkey. *—Farmer and Stock Breeder*

What To Do About Bloat

These preventatives are not "sure things," but they have worked well for some cattlemen . . .

Condensed from
Milking Shorthorn Journal

An Ounce of Prevention

MAINTAIN high soil fertility on all pastures.

Seed legume-grass mixtures of not over 50% legumes. Use a grass that will hold its own with the legume and that is palatable to cattle and sheep throughout the grazing season.

Feed grain, grass hay or straw daily before turning stock on pasture and keep coarse hay available at all times.

Work cattle onto lush pasture gradually.

Don't pasture legumes while leaves are wet from dew or rain.

Supply plenty of water, salt and mineral.

If Bloating Continues

Pasture legumes only when fairly mature—blooming or later.

Feed a commercial penicillin-salt or feed mixture. Don't try to mix your own. Use penicillin only if bloat becomes a serious problem and stop as soon as danger seems to have diminished.

Oh, if people only showed the same boldness in getting ahead on the job that they do in driving on the highway!!

Feed ½ lb. of soybean oil or ½ lb. of linseed meal with ground feed each morning before turning cattle on pasture. Reduce dosage ½ for sheep. The soybean oil will give only about 4 hours' protection.

Strip graze so cattle will eat coarser forage close to the ground.

Green-chop and feed in dry lot. Sprinkle with ¼ lb. per day per animal of crude soybean oil.

Sell chronic bloaters, particularly breeding stock.

Reprinted by permission from Milking Shorthorn Journal, Springfield, Missouri

That Pound of Cure

1. Remove bloated animal from pasture.

2. Keep animal on its feet and moving slowly.

3. Tie a wooden bit or a rope in the animals' mouth.

4. Summon a veterinarian. He may have a drug that will help to relieve pressure quickly.

5. Insert a stomach tube through throat. A garden hose can be used.

6. Drench with 1 pint of vegetable or mineral oil. This can be poured down stomach tube.

7. As a last resort, cut a hole in the rumen with a trocar or knife.

One Man Does Work of Two with Double Tractor

One man can do the work of two with the double-tractor plowing equipment of E. C. (Sam) Harris, wheat farmer in the Jordan community of Quay County, New Mexico, says Lloyd E. Cavasos, county agent, in the March issue of New Mexico Extension News. Harris can plow 60 acres a day with the equipment.

The double tractor pulls two large, one-way disk plows. The farmer plows a swath 28 feet wide and usually to a depth of six to eight inches.

Harris did the conversion work himself. He removed the front wheels of the rear tractor and attached a solid bar to the frame. Then, by means of a heavy duty trailer-type hitch he hooked the rear tractor to the drawbar of the front tractor. He attached a long rod to the clutch and accelerator which extend forward within reach of the operator riding the front tractor. The front tractor is operated in the normal manner.

The operator first starts the motor of the rear tractor, and next the front tractor. He then begins moving the front tractor and releases the clutch of the rear one, adjusting the speed as necessary. In operation, Harris adjusts the speed of both tractors so that they are the same.

Both tractors are wheat-type Minneapolis-Molines.

Harris does all his own plowing. He used his double tractor for the first time last year, and will start plowing again in July and August after harvest of the winter wheat crop.

—*New Mexico State University*

Tips On How To Select Next Tractor

Your farm and how you farm determines the "best" tractor for you . . .

Condensed from Western Farm Life

"WHICH is the best tractor?" That query is often heard. Like many seemingly easy questions, it has no easy answer.

There are three fundamental decisions to make in selection of a new tractor. They are type, size, and make. It is probably wise to make the various decisions in that order.

The choice between a row-crop (or tricycle) and a general purpose (or four-wheel) tractor is generally dictated by the type of crops that you're growing. If you have no row type crops, you will probably select the general purpose type tractor, for its greater stability and better steering qualities in soft or loose ground.

If you need a tractor for row crop cultivation, several manufacturers supply high clearance four wheel tractors, as well as interchangeable front end assemblies to convert the tricycle type to four-wheel operation where the wide front end is desirable.

If you feel that the general purpose type tractor meets your needs, then you can choose between wheel types and track types. If you have a large enough operation to keep one tractor busy without using it for row crop cultivation, you may also wish to consider the track type.

Several manufacturers of farm tractors have track type models available. Although their first cost is somewhat higher, the increased flotation and traction in soft ground conditions often enable you to get into a field well ahead of wheel tractors. Their ability to do earth moving work during the off season, either on your farm, or on a custom basis, is also worth considering.

Since the end of World War II, all farm tractor manufacturers have increased the horsepower of their tractors. Many of the so-called small tractors that were one-row cultivation and one plow tractors are now in the 2-3

Reprinted by permission from Western Farm Life, P. O. Box 299, Denver 1, Colorado

plow class, and will handle a four row corn cultivator. So, when considering a new tractor, think in terms of the capacity of the newest model, rather than the capacity of its 10-year-old counterpart.

The inclination to "keep up with the Jones" in tractor size can result in the purchase of a much larger tractor than is really needed.

Many farmers tend to consider price as the most important item in the selection of which make to purchase. Actually, the original purchase price is only one of the many factors to consider, and in the final analysis is probably one of the less important considerations.

The cost of tractor power is made up of operating expenses, such as fuel and lubricant; fixed overhead, such as taxes, insurance, interest on investment, and depreciation; and repairs. These costs must be charged against the hours of use that the tractor furnishes. This in turn depends upon the hours of use given the tractor each year, and the expected life of the tractor.

What about the type of fuel—gasoline, diesel, or LP gas? Gasoline is the most popular fuel, and probably with good reason. LP gas offers some advantages over gasoline, but except in regions where the gas is plentiful, and therefore cheap, it cannot compete cost-wise with gasoline.

It's difficult to justify economically a diesel engine in any tractor smaller than the 4-5 plow class, and then only if you have at least 1000 hours per year use for it. Here are the reasons: The increased first cost of a diesel over a gasoline tractor can only be recovered by the savings in fuel cost.

A cow's udder is a delicate, easily injured gland and every precaution should be taken to protect it from damage. Herd management, improved milking procedures and early recognition of infection are important in protecting this sensitive organ.

A diesel of the 4-5 plow size can, by its inherent characteristics, be designed to use less fuel than a comparable size gasoline engine. But it will take at least 1000 hours per year of use to save enough during the life of the tractor to make up for the extra first cost, taxes, interest, insurance, and so forth. In the smaller size tractors a diesel engine burns almost as much fuel per horsepower as a gasoline engine. Therefore, the only saving is in the cost of fuel.

With the present system of refunding all the federal gasoline

tax, and in most states, all the state tax, diesel fuel is very little cheaper than gasoline. In addition, the difference in first cost of a diesel tractor over gasoline is about the same whether it's a 4-5 plow size, or a 2-3 plow size. So, in terms of available horsepower, the first cost of a small diesel is considerably greater than that of a large diesel.

Other important considerations in tractor selection are design and construction of the tractor. This includes such things as quality of material used; workmanship in the tractor construction; accessibility of such frequently serviced items as air cleaner, oil filter, oil filler and radiator screen.

Also to be considered are such things as availability of hydraulic system, live PTO, power steering, power adjusted wheels, and all the other features necessary in a modern tractor. It's also a good idea to check such features as operator comfort, visibility and safety.

Consider the dealer from whom you intend to buy the tractor. Does he have an adequate service department and carry a good stock of repair parts? If not, consider very carefully before buying from him. If you happen to break down in the busy season, and he can't supply you with parts and service quickly, his bargain price may prove to be very expensive. The small dealer with low overhead (if it means no parts and few mechanics), may be on the verge of going out of business. Buy from him, and you are in a poor position to keep your tractor operating properly.

So, which is the best tractor for you to buy? It's still up to you, because there is no one "best" tractor. It all depends upon the situation.

Keeping an infertile cow loses $50 to $160 a year, according to Dr. F. A. Hall, Purdue University veterinarian. Dairymen can reduce this loss, Hall says, by following these simple management procedures:

1. Have a veterinarian make routine pregnancy examinations. Veterinarians can detect and correct many troubles if discovered early.
2. Keep accurate records, showing heat, breeding and calving dates.
3. Allow a 60-to-80 day rest period between calving and breeding.
4. And, when artificial insemination is used, timing is very important.

Strip Grazing vs. Rotational Grazing

Read about grass utilization in this English article . . .

Condensed from Dairy Farmer

W. M. R. Evans, Director,
Trawscoed Experimental Husbandry
Farm, England

THE efficiency of rotational-grazing, compared with strip-grazing using an electric fence, has been investigated in this country and overseas.

Results have been rather uniform. They generally agree that the overall yield of milk and live-weight changes in the milking cows are not materially favored by either system, although daily milk yield is usually more stable with strip-grazing.

But, where the daily offer of grass has been adequate, cows on strip-grazing management consistently consume less forage dry matter than their rotationally-grazed counterparts.

Strip-grazing cows have been credited with a daily dry matter consumption of about 25 lbs. and rotationally-grazed cows with about 30 lbs. where, in each case, milk production has been the same. Field-scale trials in Scotland and Holland also give an increased output per acre of 15 to 40 per cent in favor of strip-grazing.

In practice, therefore, we would expect that any particular herd, with four fields of equal size available for summer grazing, would need only to use three if strip-grazed whereas four would be needed for rotational-grazing.

Dairy farmers generally would agree that strip-grazing is particularly useful for the first grazing each season and their experience would probably bear this out. But what about subsequent grazings? Is there the same advantage to be gained?

A number of trials indicate that the advantage continues to lie with strip-grazing right through the season but many farmers have proved to their satisfaction that this is not so. This

Reprinted by permission from Dairy Farmer, Lloyds Chambers, Ipswich, England

particular point has recently been put to the test at the Trawscoed Experimental Husbandry Farms in England.

In 1957 a ten-acre field of ryegrass, cocksfoot and white clover, in its first year, was split into eight paddocks of 1¼ acres each. Four of these paddocks, chosen at random, were grazed rotationally from 30th April to 25th September; the remaining four were strip-grazed for the same period.

The field had received 400 lbs of a phosphate/potash compound per acre in late winter and 300 nitro-chalk in spring. A further 300 of complete fertilizer was applied in June.

Eight Dairy Shorthorn cows were selected to graze the rotational paddocks and a similar number, paired up for age and stage of lactation, was selected for the strip-grazed area.

The strip-grazed cows received a fresh offer of grass twice a day; the rotationally-grazed cattle were moved approximately every seven days. These moves depended on the requirements of individual groups and were made subjectively by the same person throughout. All the cows received supplementary feeding, the amounts being again decided by the same person.

As was expected from the information already available, the four rotational paddocks were grazed the first time round in precisely the same time that the strip-grazing cows took to graze three of their paddocks. By this time the grass in the fourth strip-grazing paddock was advanced in growth and was cut for hay with a yield of 5700 lbs. to the paddock.

Both groups then returned to the first of their four paddocks, at the same time, for the second grazing. From this point to the end of the season both groups moved at about the same rate

	Strip-grazed		Rotationally-grazed	
	1957	1958	1957	1958
Cow-grazing days per acre	204	223	205	223
Milk produced per acre from grass (gals.)	371	414	360	408
Material conserved (cwt.)	57	13	—	—

over their four paddocks. The strip-grazing cows showed no further additional efficiency in grass utilization.

The trial was repeated in 1958 on the same field but with a switch in the treatment plots. Fertilizer treatment was similar to 1957.

An emergency stand-by electrical generator will be more advantageous as you go to automation and require more volume of electrical power.

The pattern of grazing in 1958 was similar to 1957, except that the grass utilization by the strip-grazing cows during the first grazing was rather less efficient than in 1957. Two-thirds of the fourth strip-grazed paddock was grazed by the time the four rotational paddocks had been grazed.

The table shows the production from the grass under the two systems of grazing.

In the two years covered (1957 being a dry year), there was no difference in grazing days per acre in favor of either system. The increased milk production per acre in favor of strip-grazing is unlikely to be significant.

The only significant difference in favor of either system during this trial has been the conserved material, which arises from the increased efficiency of grass utilization associated with strip-grazing. This is, of course, a real benefit and is no doubt sufficient justification for strip-grazing, even if only carried out during the first grazing of each season.

One has to bear in mind the capital cost of electric fencing equipment and the added cost of labor.

When only fast-growing trees are left in the farm forest, they have more room to grow. Quality is better, seeding easier. U. S. Department of Agriculture foresters say that growth rate may increase twofold or threefold within five years after poor stock is removed. —*Louisiana State University*

Many people are shifting their homes to edge of town subdivisions, to the country and to areas near lakes, rivers, and streams up to 25 miles from work. The country is becoming a mixture of farms, homes, and business enterprises. Up to now, very few problems have developed, but the next few years could develop into such a mess that a solution would be impossible. Latest discussions are that county zoning is the only solution. —*Farm Facts*

What About Hay Conditioners?

They reduce drying time and risk of losing your hay crop. Whether you should buy one probably depends on how much hay you harvest . .

Condensed from Ohio Farm & Home Research

Charles V. Moore, E. T. Shaudys and *J. H. Sitterly*

WHAT you get from your hay field depends a great deal on weather conditions during harvest. During the past few years equipment has been developed to reduce the hazard of weather in hay making. The hay conditioner is one type of machine to reduce curing time and lessen risk.

Two basic types of conditioners are in use: crushers and crimpers. Both types promote faster field curing by permitting moisture within the plant to escape from a larger surface area. The hay crusher squeezes the plants between two pressure tension rollers. Interlocking corrugated rollers are used by crimpers to kink the stems at two- to three-inch intervals. Stems dry at nearly the same rate as the leaves, allowing faster and more uniform curing.

Three Drying Periods

During Ohio's June hay harvest, there has been an average of three periods of three or more favorable drying days. If field curing could be completed in two days, there would have been six periods of favorable harvesting weather. In a recent study of 26 field hay conditioners, a reduction of one day's curing time was reported. Most farmers took up their conditioned hay the day after cutting.

Added costs of hay conditioning must be offset by returns from two sources: improved quality and more hay stored. Costs of conditioning varied with the tonnage of hay harvested. Fixed or investment costs (those that do not change with the use made of the machine) were greater per acre when a small acreage was conditioned than for a large acreage.

Variable or operating costs were the same per acre for all levels. The total added cost per acre may be too great for profitable use of conditioners on smaller acreages but may be

Reprinted from Ohio Farm and Home Research,
published by the Ohio Agricultural Experiment Station, Wooster, Ohio

highly profitable on larger acreages. The average added cost was $3.50 per acre on a farm conditioning 50 acres each year (one cutting of 50 acres or two cuttings on 25 acres or three cuttings on 16.7 acres). The added cost was $1.75 per acre conditioned for 125 acres and $1.30 for 200 acres.

A farmer conditioning only 50 acres of hay each year must receive $3.50 per acre from increased nutrient value or more hay stored. This is unlikely. However, an increased return of more than $1.30 per acre is quite possible.

Whether it pays to own and use a hay conditioner depends on:

- The importance of hay to the farm business. An increase in quality and yield is vital if hay limits the size of the livestock enterprise.
- The return from capital invested elsewhere in the farm operation. Higher returns may be forthcoming from money spent for other uses.
- Reduction in feed costs by feeding hay with more nutritive value. Higher quality hay yields greater returns when fed to livestock producing a saleable product directly, such as meat or milk, than to breeding stock, such as beef brood cows.
- Increased sale value if hay is sold.

Colostrum Boosts Gains

Dairymen may be missing a chance to sell more milk and increase calf gains if they are throwing away colostrum from their herds, according to I. W. Slater, Wyoming University extension dairyman.

Colostrum, produced for a few days after the cow freshens, is essential to give new calves a good start, Slater says. It provides needed vitamins and minerals and protects the calf from diseases and infection during the first few weeks.

Older calves make good use of the rich milk, too, Slater says.

Researchers at Ohio State university saved all the colostrum from a 70-cow herd and fed the surplus to older calves. By feeding all the colostrum to calves in place of salable milk, the dairymen increased milk sales by 4,000 pounds in one year.

Calves fed colostrum gained faster and did not get scours. Calves with scours did better when fed colostrum. Researchers found that colostrum could be fed straight or preferably mixed with other milk, Slater says. —*Wyoming Stockman Farmer*

Vitamins In Swine Rations

Information to fill gaps in our knowledge of swine nutrition . . .

Condensed from
The Poland China World
Originally published in
The Merck Agricultural Memo

Dr. L. E. Hanson, University of Minnesota

IN 1928 Henry and Morrison *(Feeds and Feeding,* 19th Ed.) discussed three vitamins in their well-known book. They were the "fat-soluble vitamin" or "vitamin A," the "water-soluble vitamin" and the "antiscorbutic vitamin." The authors also listed a possible fourth vitamin, the "antirachitis vitamin." They pointed out that the "fat-soluble vitamin" (A) was very important in swine rations; that common feeds supplied adequate quantities of the "water-soluble vitamin"; and that the "antiscorbutic vitamin" was of little or no importance in the feeding of farm animals. They also stated that rickets was common in pigs, especially in winter, but were not sure whether the "antirachitic vitamin" was a distinct entity. It had been shown earlier that pigs require vitamin A or its precursors.

The decade from 1930-40 was a very fruitful one insofar as our knowledge of the vitamins is concerned. During this period riboflavin, B^6, pantothenic acid and vitamin K were isolated and synthesized. Niacin was shown to be specific for the prevention or treatment of pellagra in humans and black tongue in dogs. Crystalline vitamin D^2 was isolated, as was vitamin D^3. Biotin was isolated in pure form; the chemical structure of thiamine was determined; the isolation and synthesis of tocopherols was accomplished; and choline was classed as an accessory dietary factor.

In the early '40s confusion regarding variously labelled unidentified factors was resolved with the isolation of folic acid (folacin or pteroylglutamic acid). The climax of a wide variety of studies, over a period of 25 years or more, came in 1948 with the isolation of vitamin B^{12}.

Reprinted by permission from The Poland China World, Hamilton, Illinois

These basic studies made possible and led to numerous studies with pigs. There were a few studies reported in the '30s, but most of the reports on vitamin deficiency symptoms and vitamin requirements have appeared since the year of 1940.

Today it is known that the pig requires vitamin A and D, thiamine riboflavin, niacin, pantothenic acid, choline, vitamin B^6 and vitamin B^{12}. Folic acid and biotin deficiencies have been produced in the pig only by the simultaneous feeding of specific antagonists or of sulfa drugs. Presumably the latter destroy the bacteria in the digestive tract which ordinarily synthesize these vitamins in adequate amounts. It has long been accepted that the pig does not need a dietary source of vitamin C and no one has demonstrated the need for vitamin K. Para-amino benzoic acid and inositol have not been shown to be dietary essentials for the pig.

Vitamin E in swine nutrition is being actively investigated at the present time. With special diets, liver necrosis and death can be produced in growing pigs in a matter of weeks, even though these diets produce excellent growth. When vitamin E is added to such diets the pigs remain healthy. Strangely, perhaps, 0.1 ppm of selenite selenium also protects the pig against liver necrosis and death. No one has demonstrated the need for adding vitamin E to a natural diet.

The subterranean termite, Reticulitermes flavipes, has invited one of his sub-tropical relatives up north. Last year the Reticulitermes hageni was found swarming in a building in Trenton, New Jersey. The previous northernmost record was Washington, D. C.

Of the vitamins known to be required by swine, thiamine and B^6 need no special consideration because of their ample distribution in the feeds commonly fed to swine. The choline needs of all but very young pigs have not been studied. On the basis of the choline content of common feedstuffs and the interrelations between choline, methionine and B^{12} it is doubtful that choline needs to be added to diets which are adequate in methionine and B^{12}, at least for pigs weighing 40 lbs. or more.

Thus six vitamins need special consideraiton:

Vitamin A. Rations based on yellow corn and with good quality alfalfa meal included are not likely to be deficient. However, rations based on barley or the grain sorghums will be deficient unless good alfalfa or some other

source of carotene or of vitamin A is included. Fortunately, stabilized dry vitamin A products are available at low cost. It has been stated that these products vary in their stability.

A Penn State extension dairy specialist, estimates that 50 to 85 per cent of the dairy barns and all of the milkhouses will be remodeled or rebuilt within the next few years.

Vitamin D. We do not usually add D to swine rations unless the pigs are confined indoors. However, when pigs are confined vitamin D must be added. If the ration is properly balanced with respect to calcium and phosphorus, approximately 2 or 3 cents worth of irradiated yeast (containing 9000 IU/gram) will meet the needs of the pig from weaning to market weight.

Riboflavin. Swine rations which contain little or no alfalfa or milk products are likely to be deficient in this vitamin because the cereals and the common protein supplements are poor sources.

Niacin. Rations adequate in protein and in tryptophan should not be deficient in niacin, on the basis of published values for niacin content of feeds. Niacin deficiency has not been produced when barley has formed the major part of the diet. The author of a recent book on swine states: "A deficiency of niacin is likely to occur when corn is a large part of the ration." In another text we find: "The vitamin has a wide distribution among feeds, and thus a deficiency in the commonly fed rations of farm animals that need this factor seems unlikely."

Pantothenic Acid. Corn is a poor source of this vitamin, and barley, soybean oil meal and packing-house products are not adequate, either in terms of the levels fed or the published requirements. We have produced typical symptoms of this deficiency with a corn ration which contained 5% alfalfa meal and a protein supplement with equal parts of tankage, fish meal, soybean meal, and linseed meal.

Vitamin B^{12}. This vitamin is apt to be lacking in all swine rations which do not contain fish products or milk products. Adding B^{12} (10 mg./ton) to a ration which contained more than 6% of dry rendered tankage produced a statistically significant increase in growth rate of pigs.

Purdue and Michigan studies indicate that best results are obtained when riboflavin, niacin and pantothenic acid are added to diets together, rather than singly. There is also evidence which indicates that single vitamin deficiencies of these vitamins

rarely occur under farm conditions, and that pigs that are sick have higher requirements than healthy pigs.

Fifteen years ago great stress was placed on the use of a variety of feedstuffs in formulating protein supplements to be fed with corn to swine. Our studies showed that such supplements had to be fed at a level which supplied 20-24% crude protein in the total diet to produce maximum gains of pigs from weaning to 75 lb. Today we produce faster gains with 14% crude protein ration based on corn and soybean oil meal supplemented with minerals, riboflavin, niacin, pantothenic acid, vitamin A, vitamin D and B^{12}, and an antibiotic. According to our calculations, the vitamin supplements cost about 36 cents per pig from weaning to 200 lbs.

There are many gaps in our knowledge of swine nutrition, not only with respect to vitamins but of other nutrients and nutrient interrelationships as well. Further research will doubtless resolve these problems and probably modify our present thinking. Doubtless, too, is the probability that each solution will result in new problems.

What Is a One Man Farm?

The University of Illinois from the study of the 1957 records of 1,300 tenant farmers found 44 per cent were one-man farms.

The one-man operation on farms rented on a grain basis consisted of about 225 acres of land with 200 acres tillable and 125 acres in corn and soybeans. The livestock enterprises were feeding 14 animal units of beef cattle or sheep (an animal unit is 1,000 lb. liveweight) and raising 16 litters of pigs.

On the livestock lease farms, the average one-man operation had about 205 acres of land, 180 acres tillable, and 95 acres in corn and soybeans. The livestock enterprises were about twice the size of those on the grain farms.

The important thing, the researchers point out, is to operate enough land and to keep enough livestock to provide full employment for the labor on the farm when appropriate machinery and mechanical power are used.

Instead of eliminating the one-man farm, they find mechanization has made it possible for one man to do more jobs by himself and to farm more land than he could handle as recently as ten years ago. —*St. Paul Bank for Cooperatives News*

Wheels Slipping? Add Weight

Save tractor fuel and tire wear . . .

Condensed from Nebraska Farmer

Tom Clague

EXCESSIVE wheel slippage is costly to you in wasted fuel and unnecessary tire wear.

You waste fuel because energy is used to make the tire slip —energy that should be doing useful work, such as plowing. And your tires wear out before they should because of the extra "rubbing" during slippage.

There is only one way you can effectively control slippage. You must add weight to the rear wheels. More weight will increase the actual pounds-per-square-inch pressure of the tire upon the ground, causing the tire to "hold" instead of slipping over the ground.

Don't Deflate

This has no connection with the inflation pressure inside your tire. If you have heard that you should reduce the inflation pressure of your tire to control slippage *DON'T!* You won't reduce the slippage, and you'll stand a good chance of ruining your tires. Too-low pressure within your tire allows the sidewalls to flex too much. Operation under this condition will cause the body of the tire to break. So don't try to solve slippage problems by reducing tire pressure.

How much weight should you add? Just enough to control the slippage—and this depends upon the load you have to pull, and the condition of the ground. The bigger the load, the harder it pulls, and the more slippage you will have. Loose, sandy soil gives more slippage than heavier soils. Trial and error will be your best guide in learning exactly how much weight you need to keep your slippage at a normal level.

What is normal allowable slippage? Around 5% is usually considered reasonable. You should not be concerned about trying to reduce your slippage below that level.

How can you tell when you need extra weight? It's difficult to give a rule of thumb that is fool-proof, all the way. But you can be sure that if you can ac-

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tually *see* the wheels slipping, you need more weight.

What sort of weight should you add? You usually have two choices—cast-iron weights which mount on the wheels, or wet or dry fluid which goes inside the tube of the tire. Which should you use and why? There are advantages and disadvantages to each.

Many women spend money they can't afford to spend, to buy dresses they don't need, to impress people they don't like.

The only two places in the United States where the American Flag can fly legally at night are the National Capitol Building and the Francis Scott Key memorial in Maryland.

Cast-iron weights can be added and removed as necessary. You can install them for plowing and disking, and remove them for the lighter work during the rest of the year. However, they are heavy and are more expensive—per pound of weight added—than fluid. They also take up extra space—although they rarely interfere with operation of any equipment.

Fluid is probably the least expensive extra weight you can add. Since it is inside the tire, it takes up no extra space, and it doesn't change the appearance of the tractor wheel. However, it must be installed by a dealer who is equipped with a pump.

It costs U. S. highway departments some $50,000,000 per year to maintain that 4-inch center line in the middle of roads.

If you choose liquid, your dealer will usually add the proper amount of calcium chloride for anti-freeze protection.

If and when you decide you want the fluid removed, you will need to have your dealer do it for you.

In general, there is no difference in performance of the two kinds of extra weight. Fluid weight and cast-iron weight are equally effective in controlling slippage.

Since all situations are different, you'll have to decide what is best for you, as you experiment. Do not add more weight than necessary to control the slippage. Too much weight will produce over-compaction of your soil. And while we do not yet know very much about the dangers of compaction in soil in this part of the country, common sense tells us that it is well to minimize soil compaction.

A good way to begin would be to watch your tractor in action, pulling the heaviest load

it will have, in the type of soil that gives you the most slippage. Then add weight until you eliminate the slippage. Your dealer can probably give you some idea of how much you need.

Some Need More

Since there are "heavy-weights" and "light-weights" in tractors—when you consider engine power in relation to total weight—you will need to add more weight to some tractors than others. Thus you might find wheel weights more satisfactory for a heavier tractor, so you can add weight when necessary and remove it for light work. And you might use fluid in a lighter tractor, leaving it permanently installed.

There are special cases when you should not expect extra weight to do the whole job of preventing slippage. A slick surface, or a rank growth of soft, wet vegetation will often require chains to help control slippage.

The problem of slippage involves a number of different elements—weight of tractor, type of load, type of soil, and condition of the surface. Your best bet is to experiment, keeping in mind that you should use as little extra weight as possible to do the job.

Inoculate Your Legumes to Get Free Nitrogen

Inoculate legumes to eliminate the need for purchasing and applying most or all of the nitrogen needed to grow the crop to maturity. This suggestion comes from Dr. C. F. Eno, Florida Agricultural Experiment Station.

Nitrogen-fixing bacteria are said to be highly effective in fixing nitrogen when the root nodules appear pink. Another sign that the bacteria are actively obtaining nitrogen from the air is when the plants turn dark green and show rapid growth.

The amount of nitrogen fixed by legumes and added to the soil varies, depending upon the plant, the mineral and nitrogen content of the soil, its reaction, and the season. Estimates of the amount fixed from the air have been as high as 200 pounds of nitrogen per acre per year. Dr. Eno says an average value would lie between 50 and 100 pounds. "Therefore," he says, "as much as 10 to 15 dollars per acre may be made in terms of nitrogen fixed, if nitrogen is very conservatively valued at 10 to 15 cents per pound."

This gain in income may be realized in many ways, including higher protein for cattle, and, if the legume is plowed under, as a source of nitrogen for subsequent crops.

—*Florida Agricultural Experiment Station*

How Can We Get Rid Of Weeds?

Experiments indicate a combination of spraying and cultivation is practical . . .

Condensed from Kansas Farmer

Dick Mann

CORN-planting time brings up the old problem of weed control. No one really knows just how much weeds cost you in lost production and in other ways, but here are just a few of the benefits weed-free crops would bring, according to Warren Teel, Kansas weed supervisor:

1. Less fertilizer and water cost.
2. A definite saving on labor and equipment in the farming operation.
3. Reduced cost of operation.
4. Improved quality and quantity of products.
5. Fewer insect and disease problems.
6. Increased land values.
7. Improved public health (elimination of some allergy-causing weeds).
8. The beauty of a weed-free country.

All of you would like to get rid of the weeds in your corn crop, but the big problem is how to do it and still keep costs down and, in the case of chemical control, not damage the corn crop.

Research workers at the Kansas Agricultural Experiment Station, and other stations in the north central area, are not yet ready to advise getting rid of your cultivator. They believe the most practical plan is to use a pre-emergence spray, one post-emergence spray, or both, as a substitute for one or more cultivations.

Cost of pre-emergence spraying can be cut by limiting application to a 10-inch-wide band over the row. This controls weeds in the row and leaves between-the-row weeds to be handled by cultivation. Band spraying, according to KSC agriculture engineers, reduces cost for spray materials to about one-fourth that of full-coverage spraying. Spray attachments now are available for planters so the spraying can be done at planting time.

Following are excerpts from a report on weed-killing chemicals, as prepared by the research committee for the North Central

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Weed Control Conference. For the sake of easier reading we will separate pre-emergence and post-emergence spray findings. For actual recommendations for use on your farm, consult your local Extension agent or follow manufacturer's label.

Much mistletoe is harvested with shotguns or rifles. It grows so high and so far out on the limbs, this is often the only way to get it.

Pre-Emergence

Esters of 2,4-D have gained some acceptance. Recommended rates vary from 1 to 4 pounds per acre, depending on locality and soil type. Rates of 1½ to 2 pounds per acre constitute the usual treatment on mineral soil. 2,4-D has given satisfactory control of broad-leaved weeds and some control of annual grasses with a minimum of corn injury.

Under favorable conditions, control usually is maintained for 3 to 5 weeks. In general, most investigators have favored ester forms of 2,4-D over the more water-soluble amines.

MCPA at 2 pounds per acre has given control of weeds comparable to 2,4-D.

The alkanolamine salt of DNBP gave fair to excellent control of weeds with little or no damage to corn when applied at rate of 6 pounds per acre. High temperatures following application, however, are likely to cause severe crop injury.

Simazine—In general, rates of greater than 2 pounds per acre were required to get 90 per cent or better weed control, especially with respect to grasses.

Neburon at 2 to 6 pounds an acre has given excellent control with no reports of corn injury.

Randox at 4 pounds an acre at planting gives good control of grasses.

Post Emergence

Control of broad-leaved weeds in corn can be obtained with 2,4-D at all stages of corn growth except tasseling time. Rates generally used are ¼ pound an acre of the ester and/or ½ pound an acre of amine salt formulations applied in a minimum of 10 gallons of solution per acre for adequate coverage.

Milkweeds and members of the night-shade group of weeds survive 2,4-D, as do grassy weeds.

Proper timing of 2,4-D applications in relation to weed growth is important. Weeds in late stages of growth may be tolerant to 2,4-D.

If corn is more than 12 inches high at time of spraying, use directed applications of 2,4-D thru use of dropped extensions that apply chemical to base of

plants, thus reducing amount of chemical getting on corn leaves.

MCP and 2,4,5-T may be preferred to 2,4-D in a few instances due to a small difference in weed selectivity.

DNBP at 3 pounds per acre has given control of weeds in corn when applied before the 2-leaf stage of corn growth. DNBP occasionally causes temporary stunting of corn and there is danger of greater injury when high temperatures follow applications.

Substituted ureas, when used as early post-emergence treatments at rate of 1 to 3 pounds per acre, have given favorable weed control but frequently cause damage to corn.

Amitrol, in experimental trials, has shown promise when applied at early stages of corn growth. Some injury to corn has been observed.

CIPC, TCA and dalapon have been tried as directed sprays to control grassy weeds. To date no sure method has been found for application of directional sprays without some damage to corn.

Esters of 2,4-D, 2,4-DB, MCPA and MCPB provided excellent control of weeds in 1958 tests when applied to corn 6 inches high. Corn injury was slight.

In one test treatments with 2,4-D amine at 7 or 13 days after emergence were equally effective in controlling weeds.

Read in the paper where a chap, 90, has worked for 75 years for the same company, and isn't ready to quit yet. Reminds us of a small boy at bedtime.

Amitrol Shows Promise

Amitrol gave generally fair weed control when applied at a rate of 1 pound per acre. Corn injury was more severe when application was at the 4- to 6-leaf stage than at either the 2-leaf stage or emergence.

Simazine was found effective as an early post-emergence treatment at rates of 2 to 4 pounds per acre.

Chlorinated benzoics continue to show promise in test plots.

Some of the chemicals listed may not yet be available on the market.

Calfhood vaccination increases resistance to brucellosis. But it does not insure lifetime immunity. Vaccination of calves for brucellosis is best along with testing of the herd and disposal of reactors, say Colorado State University veterinarians.

Automate Or Liquidate!

Greyhound dogs are tricked into chasing a mechanical rabbit at race tracks so why won't hogs follow a neon ear of corn . . ?

Condensed from National Livestock Producer

Dr. M. E. Ensminger,
State College of Washington

WHEN Adam yielded to temptation and was forced out of the Garden of Eden nearly 6,000 years ago, he knew but one creed: "In the sweat of thy face shall thou eat bread, till thou return into the ground . ."

Adam had no tools with which to earn his bread and he was relatively weak and helpless as compared with his mammalian and reptilian neighbors.

It's a wonder that Adam and his early descendents ever made it. Down through the ages, however, man has learned that the sweat of the brow, necessary though it may be, will alone produce poor loaves and few. So man has learned to multiply his puny effort with the powerful tools of his own ingenuity—he automated.

Automation simply means the mechanical handling of materials in a process that downgrades muscles and upgrades brains. Through automation man has fashioned new and better tools and techniques. With automation came technology and these two great multipliers have upped the ounce to the pound; the pint to the bushel, the dozen to the gross.

Through the new and better tools of automation and technology, man has fashioned social and economic gains far beyond his fondest dreams. Despite our declining farm population, U. S. agricultural production has increased substantially.

In 1900, well over one third (37.5%) of all people employed worked on farms. In 1959, only one in eight (11.8%) of those employed are working on farms. And yet food and fiber production has continued to increase.

Today, with modern farm machinery, each farm worker produces enough food to feed himself and 20 other persons; more than five times the number that each farm worker could provide for in 1820. About half of this

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increase came about in the past 15 years; 12% of it since 1951.

By 1975, U. S. population will push above the 223 million mark and a 45% increase in live stock production will be required to feed them. This added production will require no increase in acreage, and it will be achieved with one-third fewer man-hours of labor and two million fewer farm workers.

When strawberry plants are set a foot apart in rows three feet wide, 30,000 plants will be required to set an acre.

Farms to Be 50% Larger

There will be fewer family-sized commercial farms, too, an estimated two million in 1975 as compared with the three million family farms operated today. And these farms will be 50% larger than the present 242-acre average, thanks to continued increases in technology and automation.

Automation in live stock production, however, has lagged in comparison with field crop production. The mechanization of field crops has increased 300% per man-hour since 1939 whereas mechanization of live stock production has increased only 20% in the past 20 years.

Prior to World War I, feeding and caring for live stock accounted for less than 30% of the man-hours of labor on the farm and ranch. Today it accounts for 40%. There are two primary reasons for this apparent increase in labor: (1) crop production and handling has been more highly mechanized, and (2) animal numbers have increased.

The fact remains that 75% of the live stock work is still hand labor — but with mechanization and modernization of feeding operations at least one-half of the man-hours spent in animal production could be eliminated.

It is easy to understand that four-footed animals can never become as completely mechanized as field crops. Here is USDA's estimate of the man-hours of labor required to produce $100 worth of income in various live stock enterprises.

Various Kinds Of Live Stock	Man-Hours of Labor Per $100 Production
Beef Cattle	16 hours
Hogs	16 hours
Sheep	27 hours
Dairy Cattle	62 hours
Chickens	45 hours
Turkeys	24 hours
Broilers	12 hours

Turkey and broiler production require one-third to one-fifth as many man-hours for each $100 in income as dairy cattle. The modernized poultry industry has come a long way from the days when an old hen brooded baby

chicks. The chicks were cared for by the farmer's wife, fed scraps and grain from the crib.

What the poultry industry has achieved with its "chicken of tomorrow" contests can be achieved by the live stock industry with technology and automation. We can knock 50% off the 90% of effort spent in feeding by eliminating the scoop shovel, the bucket, the feed basket and the pitchfork. We must mechanize such chores as feeding, watering, bedding and barn cleaning.

In fact, we cannot afford to overlook chore-mechanizing costs in view of the increasing wage labor costs. Prices of farm equipment have increased 2½ times since 1939, but during the same 20 years farm wage rates have jumped nearly five-fold. Modern farms cannot compete with the old back-breaking methods required by such "idiot sticks" as the rake, hoe, shovel and pitchfork.

The shift to automation on live stock farms cannot be done too suddenly. But now is the time to replace pieces of antiquated farm equipment with electric power, gravity and a little headwork. An old fashioned lead pencil and a little common sense headwork can add up to dollars and cents in the bank.

We must use more self-unloading trucks and trailers, more self-feeders, more feed bunk augers and belts, more silo unloaders, more labor-saving grain and forage processing equipment, more manure spreaders and other types of labor-saving machinery.

Live stock farms and ranches, of course, can't go completely mechanical. We still need the quarter horse because the Jeep is not sufficiently versatile for use in roping steers—although Jeeps are being used more and more for round-up and other herd activities. You might say the old fashioned round-up has been automated. Horses are trucked to and from the work area; cattle are often hauled instead of trailed to new pastures.

Haymows Will be Obsolete

Tomorrow's feed bins may make the hay mow obsolete, especially with the widespread adoption of pelleted rations for both grain and forage. Pelleted hayfers and wafers will make it mechanically feasible to move hay from the windrow to the storage area, thence into the feed bunk in a mechanized chain of operation that will relegate the pitchfork to the museum insofar as hay handling methods are concerned.

Agricultural engineers are working successfully to perfect workable and economical field pelleting machines for forages; machines that can move across

hay fields, pick up windrows of forage and compress it into dense, high quality forage pellets. This will be the most desirable manner of harvesting hay in the near future, although at present there are many obstacles to overcome.

These problems include: (1) Processing chopped forage which is coarse enough to allow for optimum cellulose digestion in the rumen and to reduce the incidence of bloat. A safe rule of thumb would include forage not chopped any finer than silage. (2) Field hay pellet machines must be produced and sold at lower costs to obtain widespread distribution. (3) Weights and power requirements of field or stationary machines must be reduced. (4) Field pelleters should be able to pellet forage in a semi-dried or wilted stage.

The benefits to be derived from field pelleting of hay are so great, however, that engineers will be able to solve these problems. This will simplify hay making, and lessen storage and transportation costs. Pelleted roughages require only one-third to one-sixth as much space as hay fed loose or chopped. Pellets reduce the labor in feeding and are suited to automatic feed handling systems. Pellets decrease nutrient losses and eliminate dustiness in feeds.

The old two-story red barn, long a traditional landmark, is fast giving way to the modern barn designed for automation. From the standpoint of maximum automation and minimum labor, the following features should be incorporated in tomorrow's live stock barns.

Palatability is not necessarily an indication of quality or feed value, but large intake is essential to high milk production.

Flexibility is Needed

Flexible Design — Changing buildings in a changing world should be flexible in design. This needed flexibility can be achieved best by construction of one-story buildings with movable partitions and equipment.

At present it is impossible to predict the kind and extent of changes that will come with further mechanization and by such developments as pelleted forages. It is obvious, however, that they will materially affect conventional storage and feeding practices, and that one will not be able to take full advantage of these and other developments unless flexibility in building design exists.

Reduce Labor—Because of the high cost of labor, now, and in the future, labor requirements must be held to a minimum. To this end, and to the extent that it is practical, all possible labor-

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saving considerations and devices should be a part of building construction.

Easily Cleaned — A barn or shelter which is arranged so that it may be easily cleaned is more likely to be kept in a sanitary condition. Construction that will permit the operation of either a power-operated manure loader, a tractor with a blade on the front or back, or a mechanical manure disposal unit, in addition to such things as smooth walls and floors, are definite assets from the standpoint of ease in cleaning.

Cattle grubs may be controlled by systemic insecticides, applied in a spray or administered in the form of a bolus (or pill). The spray, if properly applied, also will control lice and hornflies.

Proper Manure Disposal — Large drive-through doors and adequate ceiling height are essential for the operation of a labor-saving manure loader. In general, a minimum ceiling height of nine feet is recommended when it is planned to use a power-operated manure loader. There should also be provision for a manure pit, for this conserves the fertility value of the manure and makes for greater convenience.

Chore Time Saved by Mechanization

	Man Hours Per Ton	
	Manual	Mechanical
FEEDING:		
Baled Hay	.36	.32
Chopped Hay ...	.41	.17
Long Hay	.41	—
Silage (Vertical)	.59	.10
Silage (Horizontal) ...	.35	.11
Grain & Protein ..	.54	.18
HANDLING:		
Bedding	2.03	1.52
Manure	.47	.15

Here's the amount of time it takes to do chores by hand and with equipment. Figures are based on a study of 320 Michigan live stock farms. Ag Engineers R. W. Kleis and D. E. Wiant assert the biggest opportunities for time saving are in handling of silage and manure—both high-tonnage farm commodities requiring lots of labor.

Convenient—Live stock buildings should be constructed to furnish the greatest possible convenience, which means fewer steps and man hours. This means the most convenient arrangement for feeding, watering, and bedding the animals and for cleaning of barns. Among the most important points to be considered are the locations of the silo, water tanks, feed rooms or bins, hay chutes, driveways, feed alleys, stalls, doors, and windows and the arrangement for removing manure with a minimum of labor. Greater convenience usually means that one man can and will care for more animals, and this means greater profits. It is significant to note that an hour saved each day is equivalent to

a full month's work in a year.

Perhaps we need to take some lessons from the automobile and other highly automated industries. Recently, an automotive engineer surveyed a few meat packing plants—most of which would be stymied without their characteristic push carts, tubs and shovels—following which he suggested to them the following innovations, among others.

That an attempt to devise automatic mechanical (live stock) drivers should be pursued. He reasoned that since Greyhound dogs are fooled at the track with a mechanical rabbit, perhaps a neon ear of corn or recorded music would motivate the hogs, thereby eliminating the present drivers.

Speedier Method of Sorting

That a speedier method of sorting hogs be developed, to eliminate the gyrations necessary at times to get one hog from the herd. To alleviate this problem, the engineer proposed a hoisting mechanism with a vacuum attachment to pick up any specified hog by applying the vacuum cups to his broad back and quickly hoisting him out.

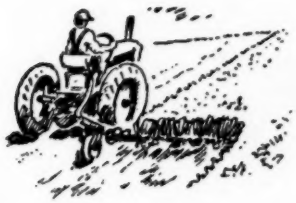
Fantastic, no; not in this age of nuclear physics and guided missiles. Nothing is considered impossible anymore.

In the final analysis, automation will benefit mankind; it has as its noble objectives greater production and lower unit costs. Throughout the industrial world, thought is focused on more machinery and technology, upon which the very survival of each industry is dependent.

It must be just so in the live stock industry; the producer of animals cannot survive in a changing world—in a period of rising sales and narrowing profit margins—by clinging to horse-and-buggy methods while the rest of industry forges ahead by applying new and scientific methods. We can and we must turn to automation; we must develop and use more labor-saving buildings and equipment.

Wool incentive payments are payments made to encourage an increase in wool production. Under this program, farmers market their wool through the usual channels. Then at the end of the marketing year, payments are made by ASC which will bring the national average wool price up to 95 per cent of parity or 62 cents per pound. Farmers who sold wool during a current marketing year, should bring their sales tickets to the local ASC office before the April 30 deadline each year.

Top Quality Forage Follows High Soil Fertility



The best forage really does come from the best soil . . .

Condensed from
New England Homestead
James E. Sheehan,
University of Rhode Island

FEED, a major factor in the cost of producing milk, actually represents about half of the costs involved. It is logical, therefore, that dairy farmers should analyze their feeding program to reduce costs if possible.

But how do you economize on feed?

Cutting down on the quantity fed is certainly not feasible. Nothing in the line of new revolutionary low-priced feed appears to be in the offing. The answer then seems to be higher quality forage.

Increased efficiency and economies are obtained through feeding top grade forage. How do we obtain it? Several factors enter into the production of quality feed:

1. Use of recommended field crop varieties and mixtures thereof.

2. Proper harvesting, curing and storage methods designed to serve the high feed value.

3. Adequate fertility management practices.

Consider the cost of managing a forage crop. Many of the costs involved are fixed. For instance, it costs the same to plow a field regardless of whether it is going to produce 10 tons or 20 tons of corn to the acre. The same can be said for harrowing, cultivating, spraying and planting operations. It costs practically as much to spread 300 lbs. of fertilizer on an acre as it does to apply 600. These are fixed costs about which little can be done, but production- and quality-wise there is something that can be accomplished. High production per acre helps reduce overall cost per unit of product. Premium quality forage is worth more as hay, silage or pasture and readily proves this by way of the milk pail.

Reprinted by permission from New England Homestead, 29 Worthington St, Springfield 3, Mass.

As mentioned high grade forage is attainable through the use of proper varieties, handling, and fertility practices. No single factor affects crop quality more than fertility. Adequate fertility not only brings about vigorous growth and high yields, but assures succulence, drought resistance, longevity of stand, and a better balance of mineral nutrients in the plant itself. Proper fertility levels encourage maintenance of desirable forage crop species which in turn discourages weed encroachment. One seldom sees a well fertilized area become overrun with weeds.

Dwarf fruit trees are recommended for home plantings, not for commercial plantings. They are easy for the home fruit grower to tend, and an attractive addition to the yard.

Start With Test

The production of top quality forage should start with a soil test to determine intelligently the nutrient requirements. Most forage crops grow best at a pH of between 6.0 and 7.0. For alfalfa and clover the soil should be at the 6.5 to 7.0 level. For corn 6.0 to 6.5 is usually adequate. Limestone needs time to reduce soil acidity, so should be applied well in advance of seeding. Limestone not only counteracts acidity but it supplies calcium which is needed for high quality and yield of forage crops, especially alfalfa and ladino clover.

Phosphate should be added in sufficient quantity at seeding time. It moves downward through the soil very slowly, similar to limestone, and is not lost by leaching to any appreciable degree. That is why the recommended amount should be applied and worked in well before seeding. Surface applications after the stand is established, while sufficient for some shallow rooted crops, may not be adequate for the deeper rooted species. Potash and nitrogen are quite mobile and can readily get down to the deeper roots in most soils.

Top quality forage and high yields are the result of adequate fertilizer applications. A grass-legume mixture of 50 per cent or more legume should be fertilized to favor the legume. If the legume is kept vigorous through adequate plant food it will in turn supply the grass companion crop with nitrogen. This means that potash is a key plant nutrient where legumes are concerned. Investigations at the Rhode Island Agricultural Experiment Station showed that one year's crop of ladino clover-bromegrass removed the equivalent of 600 to 700 lbs. of muriate of potash.

This figure does not include potash chemically bonded in the soil nor that lost through leaching. This same study and others have shown that forage crops respond best and produce highest quality when they receive a balanced ration of plant food.

For instance, we know that potash does not work nearly as well alone as when it is in the presence of adequate phosphorus and neither work as well together as they do when applied to land sufficiently fortified with limestone. You might say they all pull together as a team. A greater return is realized from fertilizer when adequate amounts of the proper grades are used. If legumes are properly fertilized with phosphate and potash on well limed land the result will be a thrifty, succulent crop.

Longevity of Stand

Potash and phosphate play a leading role in longevity of stand. Alfalfa fields flourish for a surprising number of years when adequately supplied with plant food. Well fortified alfalfa and clover are better able to withstand the rigors of winter and summer droughts. Quicker recovery after cutting and after disease or insect attacks, greater palatability, optimum nutritive value, and high yields are all closely related to high soil fertility.

When the legume population falls below 50 per cent it's time to add nitrogen to maintain high yield and quality. Nitrogen is a great growth stimulant. It drives the crop ahead. Without adequate nitrogen for stimulation, grass grows slowly and is coarse, stemmy and less palatable plus being lower in nutritive value. Nitrogen as a plant food for grass creates succulence, heavy yields and higher protein value.

Human eyes reach the peak of their effectiveness at about 10 years of age; hearing at about 20 years, physical strength and endurance about 30. Mental ability and creative powers do not reach the zenith till 60 or 70.

Grasses such as Reed canary, orchard, Sudan, timothy and bromegrass (especially Reed canary and Sudan), need liberal quantities of plant food for maximum quality and yield. Adequate fertility keeps them growing at a rapid pace.

This fast growth rate produces fine stemmed leafy grass of high quality. Reed canary, orchardgrass and Sudan grass are seldom fertilized sufficiently to enable them to produce the yields and quality of which they are capable. Under conditions of poor soil fertility they are usually coarse, stemmy and unpalatable,

making poor quality feed. No amount of conditioning, drying or supplementing will transform poor quality forage into top grade feed. The point to remember is that when nitrogen is added it needs assistance from potash and lime to give greatest returns. When stimulated with nitrogen, the potash requirement of grass is greatly increased.

Silage and grain corn crops are heavy feeders and require a balanced diet for top quality. Nitrogen, the powerful growth stimulant, pushes the corn at great speed early in the season. Later on phosphate directs the grain formation and hurries the corn toward maturity. Potash has the important role of balancing the powerful growth drive of nitrogen against the maturing effects of phosphorus. Potash also is important in building strength into the stalk to prevent lodging.

A deficiency of nitrogen means maximum growth will not be attained. Lack of phosphate affects the root system and ear formation through faulty pollination. Inadequate potash causes unthrifty growth, weak stalks, poorly filled ears and usually a lot of nubbins. Corn silage is one of the most digestible of all roughages, from 60 per cent to 70 per cent, as compared with 50 per cent to 55 per cent for legumes and grasses. Fertilized adequately it will come up to its fullest potential of high grade feed.

Remember, poor soil fertility affects forages in these ways:

1. Low vigor and yield.
2. Coarse, stemmy, slow growing material.
3. Improper balance of grass-legume.
4. Contamination of crop through weed infestation.

It doesn't cost to fertilize, it pays! Improved forage quality through high soil fertility shows up in the milk pail and on the milk check.

Revolution in Maple Sugar

Plastic tubing and central evaporator houses are revolutionizing the maple sugar industry, say U.S.D.A. researchers. The tubing takes the place of the old sap bucket, and the central evaporator house serves an entire community and does away with the need for each farmer to own and operate evaporating equipment. A network of plastic tubing conveys the sap from each tree taphole to a storage tank. Scientists are working to help farmers solve problems and develop the best ways of handling large quantities of sap.

—West Virginia University

Drylot Feeding Looks Good

A half acre feeds a cow in drylot; three-fourths of an acre is required for green chopping, and one acre for strip or rotational grazing . . .

Condensed from Hoard's Dairyman

Howard J. Larsen and *Russell Johannes,* U. of Wisconsin

ABOUT the year 1900, Hiram Smith, who was once one of the most prominent dairymen of the state of Wisconsin, said, "The most slovenly way of feeding a cow is to let her out to pasture. She destroys more than she eats. If a man is using very much fine pasture, especially on high-priced land, he is using it to great disadvantage. He could better afford to grow a crop and feed it to the cow so there should be no waste."

Now, nearly 60 years later, researchers and farmers have become very much aware of the poor job of harvesting the dairy cow does when put out to graze.

It is only the last few years that we have become sufficiently concerned to do some research to find out just what will happen if we take the cows out of the pasture and feed them cured forage year around.

For many years, this practice of feeding hay and silage year around has been carried on to some extent in nearly every area of the country. However, for the greatest majority of our farmers it is traditional to turn the cows out to graze in the spring.

At the University of Wisconsin a project has been in operation for four years to compare the merits of feeding from storage as compared with green feeding and strip grazing. We plan to conduct the experiment for an additional four years.

Carrying Capacity . . .

The information we have for the first three years shows a decided advantage in land-carrying capacity for stored feeding. We have been able to carry a single cow for the entire pasture season of about 110 days on one-half of an acre whereas with green chopping it requires a little less than three-fourths of an acre, and for grazing a little less than an acre per cow per season. This is accomplished with the same kind of forage and the same kind of land and fertility program.

There are two main reasons

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for the greater carrying capacity of an acre of forage when feeding cured forage. One is less waste and the other is the amount of forage dry matter produced per acre.

Using our best grazing systems and grazing as carefully as we can, we lose from 20 to 30 per cent of the forage dry matter produced. This is lost through fouling by the animal and by selective grazing.

The Empire State Building was sold in 1952 for $52,000,000, the largest price ever paid for one building.

When green feeding, we lose only as much as the cow pushes out on the feeding floor, leaves in the wagon, or is blown out of the wagon when cutting the forage. The loss here is directly related to the degree of good or bad management, and this is around 2 per cent in our operation.

The loss in stored feeding is dependent upon field losses in harvesting and the amount the cow leaves in the manger. We lost about 11 per cent because of the forage that was refused.

In spite of our loss, we harvested about 1,000 pounds more forage dry matter when feeding stored forage than with either of the other two systems. The main reason for the greater production of forage dry matter per acre is the fact that the forage was all harvested at a later stage of maturity than either pasture or green feed. In both green feeding and strip grazing, the forage was harvested from early growth to early bloom, whereas the hay and silage was all harvested at early bloom.

More Milk Per Acre . . .

The daily milk production for stored feeding was about the same as the other two systems and as far as we were able to see there wasn't much difference in milk production when the other animals went on green forage.

The production in pounds of milk per acre on stored feeding over the first three years was about 1,000 pounds greater than for green feeding and nearly 1,800 pounds more per acre than strip grazing.

With the limited data that we have at present, it appears that when feeding high-quality hay and silage from storage during the summer months it takes less acres, there is less loss of forage than when pasturing, and we get considerably more milk production per acre than when either green feeding or grazing.

Conditions to be Met . . .

There are, however, a few things we must ask ourselves be-

fore going into a stored feeding summer program.

1. Do we have the additional space for grass silage to be fed during the summer?

2. Is our barnyard in such shape as to stand up under continued heavy concentration of cattle during the spring, summer, and fall months and remain in a sanitary condition?

3. Do we have good hay-and-silage-making facilities available?

4. Can we get top-quality hay in the mow and top-quality silage in the silo every year?

In addition to these four conditions, we must be reasonably convinced that this system will work. If so, any farmer can work out many of the kinks that are bound to come up on his farm when changing to a different system of summer feeding other than the present summer feeding setup.

Stored feeding during the summer months, as we see it, will bring with it some additional advantages.

1. The animals can remain closer to water in the hot summer, if all the cool, fresh water is near the buildings.

2. We should not experience a serious "summer slump."

3. Our forage can all be harvested at near the optimum or same stage of growth for best quality and quantity.

4. We have better management of the fields since fences can be practically eliminated and grazing areas do not have to be provided for. This is true, of course, unless we have some land that cannot be harvested by any other means than by pasturing.

5. In eliminating fences between fields, we gain some acreage which is sizeable on some farms. In removing fences, we eliminate a hindrance to necessary conservation practices.

With the limited experience we have had thus far, it seems that some system of providing stored forage looks quite favorable. It could very well be that we may see the day when very few of our cropland acres will be pastured.

A new citrus variety, a cross between an orange and grapefruit, has been discovered by Carlos G. Moscoso, horticulturist at the University of Puerto Rico. Called the "chironja," this new variety is described as an "all-purpose fruit." The chironja is said to have "all the good things of a grapefruit and orange combined, with a flavor closer to that of an orange. It is slightly bigger than most grapefruit, orange-yellow in color, with a smooth, glossy skin."

—*Texas Farming and Citriculture*

Look What They're Doing With Oats

Smart farmers are making oats pull their own weight, as well as nurse crop a legume. Here are six oat uses . . .

Condensed from The Farmer

Robert G. Rupp

IS your oats crops doing the job for you?

Ambrose Lewandowski rotation grazes oats. Jerald Hanson green-chops it. Art Backlund makes oats silage. Bob Allen uses it for winter cover to tie down sifting soil.

Bill Schol makes oats control wild oats as well as furnish silage. Louis Geronime gets a two-way stretch, too. He cuts part of his field for green-chop, the rest for grain.

Those six farmers are getting extra mileage from a crop that generally isn't considered much of a money-maker. Oats is important, yes, as a nurse crop for legume seedings. But as a top-return grain, it doesn't measure up.

Agronomists figure 32,000,000 acres of oats were seeded in the United States last year. Of that, four-fifths had the primary job of nursing legumes into being.

Not so with these six. They wanted more from oats, and they got it. You can, too. Here's how:

Ambrose Lewandowski is a Central Minnesota dairyman.On what used to be a 24-acre, Wright County woodlot he now has a thriving grass-legume pasture. He got it through use of oats as a nurse crop. But he got full use of his oats in the process —about three times as much as do farmers who harvest oats for grain.

Last spring Mr. Lewandowski seeded 1½ bushels of Andrew oats, an early variety, in his worked-over woods pasture. He also put in an under-seeding of four pounds of alfalfa, two of bromegrass, two of timothy, and one each of alsike and ladino clover. That was done in the normal way, at the normal time. From then on, things were handled differently.

When oats got up eight to ten inches, Mr. Lewandowski turned in his cows, letting them graze off the oats, a strip at a time. As a strip was grazed, cows

Reprinted by permission from The Farmer, 55 East 10th St., St. Paul 1, Minnesota

were moved to another.

Oats, clipped down by cows but not killed, grew back.

As it again reached eight to ten inches, in came the cows for a second grazing. By now alfalfa, given extra exposure to sunlight during the period oats was short, was about as tall as the grain. Cows had extra good pasture.

Again they ate it down, and were taken off. Again the oats grew back. And again cows were turned on. This third grazing was in mid-September after oats had been given sufficient time to make good late-summer growth. Legumes by this time were well established and didn't appear to be any the worse for wear from grazing.

Mr. Lewandowski didn't clip oats after strips were grazed, unless weeds were a problem. He preferred having the mature oats stubs remain standing. "Those old stubs help prevent bloat," he explains. "It cost me two heifers to find that out."

Jerald Hanson, in Turner County, S. Dak., green-chops oats for beef cattle.

"I like oats chopped fresh from the field and fed fresh daily," says he. "So do the cattle. They eat it better than oats silage."

He starts chopping oats when grain is in the early milk stage, continues until it is in late dough and starting to harden. What can't be cut as green-chop is made into silage when in the early dough stage.

Mr. Hanson handled 30 acres that way last summer "and I should have had more. I was feeding 300 head of steers and heifers, and it didn't last any time at all."

Whole milk equivalent exports from the United States during 1958 were almost four times as much as in 1957.

The oats, underseeded with a legume mixture, was sprinkle irrigated. It made about six tons to the acre.

Both silage and green-chop were fed to full feed, finishing cattle as well as high-roughage, growing cattle. Finishing heifers got ten pounds of shelled corn daily, one pound of 34% protein supplement, and all the fresh, chopped oats they would eat daily. Growing steers got supplement and all the green-chop they wanted, but no corn. "I wanted to grow them more."

Art Backlund is another southeastern South Dakota beefman who likes oats for heifers. "I feed oats silage to heifers up to 30 days before market," says he. On his farm in Clay County he feeds oats silage free choice with

a one-third ground ear corn to two-thirds cracked shelled corn mixture. "I start heifers on silage as soon as I shut them in the yard, and keep them on it until just before they're finished."

Bob Allen, in the Red River Valley, uses oats in quite a different way.

He's a sugar beet farmer and his problem is holding summer-fallowed topsoil in place over winter. Last fall he tried oats as an anchor—and it worked.

Experimenting — along with about 25 other Clay County, Minn., farmers—Mr. Allen seeded 100 acres of flat, summer-fallow ground to oats in mid-September. He seeded Rodney, at three pecks per acre, crossways to the prevailing wind. The oats had about 1½ months of growing time last fall before freeze-up, ample time to produce sufficient cover to catch snow and shield soil against wind.

That oats was winter killed. But it has done its job. Come spring it will be worked in and the summer-fallowed field planted to beets. "I'm well sold on this practice for protecting open soil," says Bob. "I may have a little residue which may be a problem the first time I cultivate beets this spring. But I can afford a little trouble cultivating for the amount of topsoil I saved."

To get around excessive growth, which was heavier than usual last year because of the late, mild fall, Norman Krabbenhoft pastured his cover crop with sheep for a time. That gave him extra mileage from oats, plus winter protection.

Fall seeding of oats is a new practice, just tried out last year. It grew from a need, recognized by the Soil Conservation Service, the American Crystal Sugar Company, the Agricultural Stabilization and Conservation (ASC), Clay County soil district board supervisors and farmers alike, to protect soil.

"A year ago we lost thee inches of topsoil from one farm during the winter," reports Les Pulkravek, Clay County SCS technician. "Not all farmers lost that much, but there was at least an inch of soil blown away per farm."

To stop that costly loss a meeting was held and the winter cover idea developed. It had been tried in lighter-soil areas of the Valley and found to work. So, encouraged by SCS and the sugar company, ASC set up an ACP conservation practice under which 50 cents per acre would be paid on a cost-share basis for seeding oats, or $1 per acre for seeding barley or winter rye.

Quite a few farmers tried it, and according to Mr. Pulkravek, "about 25 farmers south of Moorhead have accepted winter

cover seeding as a permanent soil-protection practice." More will probably adopt it as they see how well it works.

Still a different use for oats was tried last year by Bill Schol, a North Dakota farmer. He figured oats could do double duty in his rotation—provide high quality silage for his 54 beef and dairy cattle and kill wild oats at the same time.

Value of average farm land in Connecticut, counting buildings, is $247.00 per acre.

"Oats are tolerant to wild oats," points out Mr. Schol, "so the weed grows readily. Yet oats are usually ready for harvesting as silage before wild oats can go to seed."

Working on that theory, he seeded 17 acres of early oats on his Grand Forks County farm last spring. At early dough stage he cut 125 tons of silage from the 17 acres. "It was good quality silage, too," reports Harold Holte, Grand Forks county agent who worked with Mr. Schol on the two-way program. "Oats silage isn't as high in total digestible nutrients as corn, but it is higher in protein. And oats as silage is a lot higher in TDN than as grain."

Another farmer who gets double duty from oats is Louis Geronime of Dakota County, Minn. A dairyman, he cuts part of his oats for green-chop, the rest for grain.

There are about 150 varieties of oak trees including some shrubs as well as large trees.

Shortly before oats begins to head, Mr. Geronime, who green-chops a season-long variety of crops for his dairy herd, moves into oats fields with his chopper. He cuts a few swaths around edges of fields, and a few more through the field, splitting it for easier combining.

Gets Grain and Forage

That does several things. First, it gives him a few days of green-chopped oats, allowing some other crop time to get to best forage growth. Second, it opens up fields for later combining, doing away with the loss that comes from knocking down grain during the opening round. Last, and most important from a maximum use standpoint, it gets double mileage from part of the oats. Because that which is green-chopped early will grow back enough to be green-chopped a second time, just before harvest.

Kenneth Kasper in Steele County, Minn., uses oats for green-chop. He feeds dairy cows in drylot the year around, chopping rye in mid-May, then alfal-

fa, then oats as it begins to head, then back to alfalfa again. He also makes silage of oats, cutting it when in the "good dough stage."

Dr. Rodney Briggs, University of Minnesota agronomist, is a staunch proponent of oats as silage. "Many farmers who harvest oats as silage are realizing 50% to 200% increase in total digestible nutrients per acre over harvesting it for grain," says he.

"Cost of producing a hundred pounds of TDN is reduced about half when oats are harvested as silage rather than grain," he points out. "Removing oats earlier lets legumes grow better, and may produce a one to 1½-ton cutting of stubble hay the same year."

Tests in five Minnesota locations have shown an average yield of 2,374 pounds of TDN from oats as silage, compared to 1599 pounds as grain. At the Waseca station oats silage produced 2500 pounds of TDN, compared to 819 for grain. "This increase is equivalent to 38 extra bushels of corn," says Dr. Briggs.

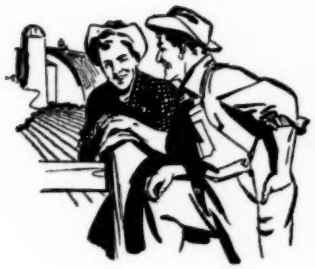
Using fertilizer on oats at Waseca increased silage tonnage from 3.5 tons per acre to 15. Best fertilizer to use can be determined by test.

At the Grand Rapids experiment station in north-central Minnesota a seeding mixture of one-half bushel of Canadian peas and two bushels of Ajax oats per acre produced eight tons of high-protein silage. At the Northern Great Plains station at Mandan, North Dakota, oats peas silage was equal to corn in that area for total forage yield per acre. It was the best dairy feed of several silage mixtures.

Oats silage tonnage in Wisconsin averages about seven per acre —equal to 90 bushels of oats grain per acre in TDN. In digestible protein, seven tons of silage is equal to 115 bushels of oats grain. It's a good farm crop —and a profitable one when utilized to best advantage.

Is pelleted hog feed more efficient than meal? At Michigan State University, pigs fed from 121 lbs. to market weight on pelleted ration gained 23% faster than meal-fed pigs requiring 18% more feed per lb. of gain. The costs of gain per 100 lbs. were $13.14 for the meal-fed pigs and $11.63 for the pellet-fed lot, including the pelleting cost of $3.00 per ton with 11% cheaper gains for the pellet-fed lot. Maryland recently reported cheaper gains on pellet-fed but the cost of pelleting about offset the increased gain.

—Gish Agricultural Service



Ideas On Hay Drying

Questions farmers asked at the Northeast Hay Drying Association meeting in Maryland . . .

Condensed from Pennsylvania Farmer

Robert H. Williams

DIRT farmers packed a Quonset building on the University of Maryland campus recently to hear a "blue-ribbon" panel discuss hay drying. The meeting was sponsored by the Northeast Hay Drying Association.

Here are some of the questions and answers asked by the farmers in attendance.

Are two passes over hay with crusher better than one?

Two-pass operation speeds drying time in field approximately one hour, said Albert Best, New Holland Machine.

Is crimper or crusher best?

New Holland sells both, Mr. Best explained. Early studies indicated crusher saves time.

What is upper limit for moisture if hay is being baled for heated-air drier?

Sixty per cent, said Professor Mark Singley, head of Rutgers agricultural engineering department. If bales are extra loose, moisture limit could be raised.

Is alfalfa stand hurt when first cutting is made in prebud stage?

No, replied Sam Stellatella, farm supervisor at Rutgers University. Agronomists later in meeting recommended that alfalfa be cut at bud, or earlier to give second growth quick start and help hold down lodging of first cutting. Lodging can also be lessened by applying fertilizer after first cutting, agronomists said.

Is good crushed field-cured hay better than good heat-dried hay?

Dr. R. F. Davis, head of dairy department at University of Maryland, said field-cured "might be" better. But, he noted, heat reduces fermentation time and helps make more total hay.

How about sunshine factor?

It's true that field-cured hay has more Vitamin D, said Dr. Davis, but cows manufacture their Vitamin D when they lounge in sunlight; and don't

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need much from feed at any time.

What should bale weigh in field if you plan to heat-cure?

At 45 per cent moisture, said Charles Wolgemuth, manager of Hershey Farms, a 30-inch bale should weigh 45 pounds. Mark Singley says bale should weigh five pounds per cubic foot when dry.

U. S. has 95 cities with 100,000 populations or more.

Is it necessary to feed high-priced supplements if you have top quality feed?

With good legumes and fertilized grass, said panel, dairymen and livestock farmers need to buy little, if any, protein supplement.

Is it better to suck or push air through hay when drying?

Fan does better job of pushing air, Prof. Singley said.

Why push air down through hay in wagons?

You get more uniform drying of load, Prof. Singley explained. Here's why: Top layer is loose and air tends to pass around bales in this layer rather than through them. Bottom layer is compact and crevices between bales are jammed tight. Air filters through bales there as readily as it does between.

Should you cut when dew is still on hay?

If it looks like good hay-making weather start mowing regardless of dew, Sam Stellatella advised. Waiting for dew to dry could cost farmer two hours of valuable time.

Is hay drying a rich man's hobby?

Drying with heat is practical, stated Mr. Woglemuth. He said value of heat-dried hay really showed up in dairy barns at Hershey. In one test, a Holstein herd was divided equally into two strings. One string received heat-cured roughage only; the other received the same hay plus grain. After five years the total production of the two strings is almost identical. The conclusion at Hershey: grain doesn't pay if top-quality roughage is fed.

Egg shell color may vary from white to deep brown. Color is a breed characteristic. Shell color does not affect the flavor, the nutritive value or the cooking performance.

Is recirculation of air worth additional investment?

If putting up building, said Prof. Singley, the answer is yes. If not using building, additional expense for recirculating air is questionable.

What is minimum capital out-

lay for a farmer who wants to heat-dry 500 bales a day?

Platform batch, $2,500; wagon system, $4,000. That's estimate of Mr. Best. Wagon system has labor saving features. You can turn out more work with wagons, believes Mr. Stellatella, and men don't handle wet bales.

What is highest air temperature recommended for batch or wagon system?

Hershey Farms holds air to 150 degrees Fahrenheit. Safe limits are 140 to 180 degrees Fahrenheit, thought Mr. Wolgemuth. At Penn State, it was noted, hay was dried with air ranging from 100 degrees to 200 degrees Fahrenheit. Researchers found, however, that hay dried at either extreme was hard to digest.

Is it practical to extend hay drying season?

In 1957, folks in the audience indicated, farmers with heated air systems made most of their hay in early spring or in the fall. Hay just didn't grow during prolonged drouth. One New Jersey farmer said he couldn't have harvested a cutting of hay in the second week in November without his wagon system.

How late can you cut and still save alfalfa stand?

"I often leave no cover over winter and have never noted any damage," said the Rutgers farm manager. He cuts into November, at times.

Agronomy department at Maryland recommends last cutting be made after first killing frost, Prof. Davis said. Then there is no drain on nutrients stored in roots by a late surge of growth.

Time of last cutting depends on soil, said John Baylor of Penn State. On well-drained soil, cut late; on wet soils, don't.

Chickweed becomes problem in Maryland if no cover is left on alfalfa field over winter, it was noted.

Manure or natural cover helps prevent heaving, another person said.

Does the hay saved by modern systems pay for heat-drying equipment?

If farmer saves 10 per cent more hay, Professor Davis pointed out, he has paid for his equipment. The University of Maryland professor said most farmers only harvest 80 per cent of the hay crop they grow each year.

What are average losses of forage crop?

U. S. Department of Agriculture has completed five years of tests. According to one scientist in audience, there is a 15 per cent loss of dry matter with barn-cured hay; 15 per cent with wilted silage; and 20 to 25 per cent with non-wilted silage.

Soybeans As A Feed Crop

Here's a way to eliminate the need for additional protein supplement . . .

Condensed from The Dakota Farmer

SOYBEANS can fit in well with a livestock operation, as well as being a cash crop. Both the beans and forage are high in protein, making protein supplement unnecessary when they are fed to livestock.

Producing the soybean for beans is nothing to get rich from, since there are more profitable crops such as potatoes, small grains, sorghum, and corn that produce higher yields and earn more dollars per acre. But the beans have been free of controls, allowing many of us to keep our cropland busy in the face of shrinking acreage allotments.

For the livestock feeder and dairyman, soybean hay and silage offers a high-protein roughage which often eliminates the need for additional protein supplement.

By itself, soybean silage is generally too strong-tasting and foul-smelling to make a desirable feed. These undesirable features are a result of the high protein concentration.

The best way to cut down the concentration of protein and make the silage more attractive to the stock is to mix the bean roughage with corn or sorghum at silo-filling time. Both corn and sorghum are very low in protein, and they need some extra supplement when their silage is fed.

Two or three parts of corn or sorghum to one part of soybeans makes a well-balanced silage that keeps well and is palatable enough for livestock. It has no bad effect on milk, either.

Soybean hay makes good livestock feed if it's cut before it gets too coarse. The optimum cutting time is after the pods have formed and when the lower leaves start to turn yellow. It's as good as alfalfa hay, although small lambs should get only the finest and leafiest.

Grinding the soybean hay will make it a little better for small animals, and poultry like it bet-

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ter that way. It makes a good substitute for alfalfa meal in poultry rations.

Brood sows do all right on a ration of soybean hay, tankage, and corn, and gilts on this ration will often farrow especially good litters. As a general rule, soybeans are good for hogs, except that they tend to make the meat soft.

Purdue agricultural engineers suggest that farmers investigate the cost of piping water in plastic pipe to pastures this summer.

Soybeans make good pasture, even though they don't last long when animals are turned into the fields. Cattle are the roughest on them, since considerable damage is done by trampling.

Sheep and turkeys do exceptionally well on soybean pasture, due to both the protein and the carbohydrate content of the crop.

For summer pasture especially for cattle, a mixture of Sudan grass and soybeans is hard to beat. They can be planted at the same time, and they are ready when other pasture has dried up or has been grazed to the limit.

As a legume, the soybean fixes nitrogen from the air. If the vines are plowed under, they contribute nitrogen to the soil, even though the beans have been combined and taken off the field. Soybeans don't do the soil any good when silage or hay is made from the vines, although some of the nitrogen will be returned as manure.

When the beans themselves are fed as a protein supplement, grinding or cracking makes them more digestible. The oil in the beans makes grinding difficult if the beans aren't mixed with grain first.

Game birds like the beans. A few left standing in the corners and edges of fields will attract pheasants and quail.

A number of diseases will attack soybeans, but none of them are as threatening here in the Dakotas as rust is on wheat. The usual result of soybean disease is that the crop is reduced a little, so diseases may not even be noticed. This is especially true of the root diseases, as their symptoms are very similar to the effects of drouth.

Our Great Lakes contain about 1/3 of the fresh water on Earth.

For the most part, diseases like Rhizoptonia and Fusarium can be avoided by careful rotation. They are the most prevalent when beans follow beans or flax.

There is no known varietal resistance to these root diseases, although there is some to Phytophthora, a stem disease. When beans follow beans, there is always some danger of Septoria leaf spot.

When the Government winds up a year with a surplus of cash, most of the taxpayers don't.

Good seed is very important in soybeans. If downy mildew infests the seed, it will later infect the plant, with a reduction in yield. Perhaps the worst difficulty we can run into with soybeans is to get seed that hasn't been stored carefully. The easiest way to get around this is to make a germination test on a sample of seed, or insist that a recent test has been made before we buy the seed.

Soybeans can be planted with an ordinary corn planter set to drill rather than to check. This provides rows that are easy to cultivate in areas where weeds are a problem. For those who don't need to cultivate, a grain drill with every other feeder plugged will give the plants enough room to grow. Seeding rates of 50 pounds per acre for 40-inch rows and 60 pounds for narrower rows are advisable in the moist areas of the Dakotas, while other areas will do better with lower rates.

Soybeans need to be inoculated before planting for highest yields, but they require no nitrogen fertilizer. If phosphate is used, it's important that the fertilizer not be put in contact with the seed, as this will reduce germination.

Soybeans are no wonder crop. But their high protein content makes them a good protein supplement, whether used in ground feed, as hay, or mixed in the silo with corn, sorghum, or grass silage.

One-Way Disk Harrow Proven Best for Trash Conservation

From field studies conducted in Alberta, it was found by Canadian researchers that, with shallow tillage and the equipment operating at moderate speed, best trash conservation was produced with the one-way disk harrow. At suitable speeds, it was found that 45 and 22 per cent of the original surface trash was retained by shallow tillage after one and two passes, respectively, as compared with 27 and 12 per cent for deep tillage.

—*Agricultural Engineering*

Pep Up Your Old Pasture

Even the roughest land will produce well if handled right . . .

Condensed from Prairie Farmer

PASTURES, a vital source of roughage on any farm that has livestock, should be cared for as much as any other cultivated crop. On many farms, pasture is part of the rotation system. Pastures in rotation get fertilizers and are shorter lived than pastures on land that is not suited for rotational cultural practices.

Many acres of land of varying degrees of fertility are wasted as a pasture due to the fact they are not in the farm's crop rotation.

Generally such lands are rolling bluegrass fields that the farmer doesn't want to plow due to the danger of soil erosion. The Soil Conservation Service offers soil and water plans that avoid cropping programs, if possible.

Poor pastures in bluegrass or quackgrass, plus plenty of weeds, make very poor feeding in spring and fall and practically nothing in summer.

If such lands can be tilled they can be redeemed and improved for pastures. The first step is to kill off all weeds and grasses. This can be done in one of two ways or a combination of the two.

Weed Kill by Tillage

One method is by tillage, using a springtooth harrow, field cultivator, or disk. If the land can be plowed, use the plow. If the tillage tools are used, it will be necessary to work the field five or six times.

The soil should be well dug up with the tillage operations going across the slope wherever possible and never up and down. This operation should start when the grass dries up in late June or early July. It takes two months of tillage work to get the field in shape for seeding.

Just before seeding time, disk the field to prepare a good seedbed. If farm manure is available, make an application about midway in the tillage operations.

The other method of soil preparation involves using a chemical weed killer plus one tillage operation. There are several grass chemicals. One adapted for this work is dalapon. It works best during the summer.

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When applied in June any bad effects on plants would be gone by grass seeding time.

The average cow in the U.S. produces 6,200 pounds of milk a year — only enough to provide her owner with a return of about $9 a year over total cost of feed and care.

M. B. Tesar, farm crops researcher at Michigan State University, recommends using 5 pounds of dalapon per acre. It costs about $1.25 a pound. Spray it on in late June or early July. When the grass is killed finish off the field with one cultivation across the slope. This will get most broad leafed weeds, such as plantains and dandelions. Disk to make a seed bed.

Weed Kill by Chemical

The use of dalapon cuts materially the time needed for field preparation with tillage tools.

With the grass and weeds eradicated or subdued, the field is ready for seeding. Soil tests should have been made for lime and fertilizer. If lime was needed it is well to apply it in the middle of the tillage operations.

Use fertilizers according to the soil test needs, at the rate of about 400 pounds per acre. On heavy soils one can generally use 0-20-10 and on lighter soils 0-20-20.

The pasture mixture, according to Tesar, can be 8 pounds of alfalfa, 2 pounds of bromegrass, and ¼ lb. of ladino clover. Tesar recommends vernal alfalfa. It is hardy, quite disease-resistant and in a pasture field where it might stay as such for several years, he believes vernal is best. The best of seed should always be used in such a pasture.

When seeding time comes, a peck of oats per acre can be used for two reasons. One is to prevent soil erosion and the other to make better distribution of the bromegrass. The seed should be sown shallow. If possible use band-seeding methods. After seeding run a cultipacker across the slope to pack the soil.

Marketing agencies get about 60 cents of our food dollar now, and the farmer about 40 cents. Approximately half the food marketing dollar goes to pay for labor.

Once this pasture is established it can be topdressed with manure or commercial fertilizers, or both. A usual application is 250 pounds of a fertilizer high in phosphorus.

Pasturing should not start until the grass and legumes are well established. Annual pasturing should not start in the spring un-

til the plants have good growth.

It is possible the new pasture could be divided into fields and used in rotation. This could prolong the effectiveness of the pasture.

Pasture improvement work was started in Grand Traverse county, Mich., in 1953. Some of the work used the methods that have been described in this article. The crop mixture was alfalfa, trefoil, and ladino clover.

Among the seven different rates of application, 400 pounds of 0-20-20 and 15 tons of manure at seeding time, gave best results. The average yield of the plot with the fertilizer and manure, two cuttings a year, gave 3.4 tons of feed per acre. The plot that had no manure and the same fertilizer yielded 3.05 tons of feed per acre.

The effects of the manure could still be seen in 1958. The average production of feed in the all fertilizer and manure plots was 3.30 tons. With no manure the average yield was 2.88 tons. These plots have had an annual application of 400 pounds of 0-20-20 fertilizer each fall starting in 1954.

Lespedeza May Grow Where Alfalfa Won't

In those areas where soil fertility and organic matter make the use of alfalfa questionable, Sericea lespedeza shows promise as a long-lived perennial legume. Some of the best stands at Illinois' Dixon Springs Experiment Station were on slopes where erosion had taken 3 to 6 inches of topsoil.

Sericea makes little or no growth the first year. After that a hay crop and a seed crop or two hay crops may be removed each year. Hay yields are one to four tons a year if cut when 12 to 14 inches tall. Total protein in the hay runs about 13 per cent compared with about 15 per cent for alfalfa. Seed yields vary from 200 to 500 pounds an acre. As a hay crop Sericea has the advantage of curing much more rapidly than other legume crops harvested in the spring. Usually it can be cut one morning raked in the afternoon and baled the following morning.

Fertilizer requirements are the same for Sericea as for common lespedezas or other forage crops. Lime, phosphate and potash should be applied according to soil test. Good stands result from inoculated, scarified seed broadcast at 35 pounds an acre on a good, cultipacked seedbed. Spring plantings provide a conservation reserve cover.

Dixon Springs Experiment Station

FUN ON THE FARM

A Collection of Jokes and Humorous Farm Stories

These Modern Times

Once it was dark and quiet in the stable,
With just the clank of milk pails here and there,
While Father milked as fast as he was able.
With now and then a pause in which to swear.
But now there is a humming and a throbbing;
The radio gives forth a merry song,
With rhythm all the udders are a-bobbing,
As milking time goes happily along.
But oh, the awful language and confusion,
If there's a power outage in the land,
And Father doesn't find it so amusin'
For he's forgotten how to milk by hand.

—J. A. A., Dewdney, B. C.
in *Butter-Fat*

★ ★ ★

Whether a man winds up with a nest egg or a goose egg depends somewhat on the chick he marries.

One day an Indian came into a bank in Oklahoma and asked about a loan. "Me want $200."

"And what security have you?"

"Got 200 horses."

This seemed sufficient security and the loan was made. A short while afterward the Indian came back with $2,200 in cash, paid off the note and started to leave with the rest of the roll in his pocket.

"Why not let me take care of that money for you?" asked the banker?

Looking the banker straight in the eye, the Indian asked, "How many horses you got?"

★ ★ ★

An old-timer can remember when a child who misbehaved to get attention — got it.

★ ★ ★

A visitor to New Mexico was talking to a sun-browned native, and commented on the lack of rain. "Doesn't it EVER rain here?" the tourist asked.

The native thought a moment and said, "Mister, do you remember the story of Noah and

the Ark, and how it rained 40 days and 40 nights?"

"Sure I do," said the tourist.

"Well," drawled the native, "we got a half-inch that time."

Iowa Farm Bureau Spokesman

★ ★ ★

Marital troubles may result from a man being so busy earning his salt that he forgets his sugar.

★ ★ ★

A new farm hand from the city was told to harness a mule one winter morning in the early hours. In the dark he tackled a cow instead of the mule. The farmer shouted from the house, "Say there, what's keeping you so long?"

"I can't get the collar over the mule's head," shouted the new man. "Both his ears are frozen solid."

—*The Dakota Farmer*

★ ★ ★

"You mustn't pull the cat's tail," a mother warned her small son. "I'm only holding it, Mom," the youngster replied seriously. "The cat is pulling."

★ ★ ★

A little tot in church for the first time, watched the ushers pass the collection plates. When they neared the pew, she piped up so everyone could hear: "Don't pay for me daddy; I'm under five."

"Oh, what a funny looking cow," the sweet young thing from New York told the farmer. "But why hasn't it any horns?" "There are many reasons," the farmer replied, "why a cow does not have horns. Some are born without horns, and some do not have them until late years in life. Others are dehorned, while still other breeds are not supposed to have horns. The reason this cow does not have horns, is that it is not a cow at all, but a horse."

★ ★ ★

This is a true story of a couple from the city with a 10 year old daughter, who visited a Colorado ranch last summer. The little girl asked if she could watch the cows being milked and she was allowed to.

At supper that evening when her mother noticed the glass of milk at the little girl's place was untouched, her mother said, "Martha, why don't you drink your milk?"

In a low voice Martha whispered to her mother, "Mother, if you knew where it came from you would not drink it either."

R. F. Carpenter
Hayden, Colorado

★ ★ ★

"In the old days a man who saved money was a miser; nowadays he's a wonder!"

POME

The editor's hair grows grey,
His fingertips grow sore,
Yet some so-and-so is sure to say
"I've heard that joke before."

★ ★ ★

A western old-timer had tried to cater to men only in his rustic time-worn hardware store—specializing in tools, ropes, and range hardware — but gradually the times were too much for him.

One day when a range-man came in to buy a saddle, the telephone kept ringing persistently and was just as persistently ignored. Finally the customer said, "Go ahead, I'll wait while you answer."

"Oh, I hear it," the hardware man said disgustedly. "Fool women — they asked me so often why I din't put in a telephone that I put one in just to keep 'em quiet. But I never answer it."

★ ★ ★

The rural school teacher was discussing the wonders of modern science, and in particular various kinds of machines. Asking the 9-year-olds what were the most wonderful machines they had ever seen, she got all the stock answers — airplanes, television, robots, tractors, etc. — until she pounced on one thoughtful but hitherto-silent little girl.

"Well, Janie," she said, "and what is the most wonderful machine you know?

A slight pause, and then, laconically, the girl answered, "A hen."

"A hen?" repeated the teacher. "Whatever makes you say that?"

"Well," replied the little girl, "do you know anything else that will take all our leavings and turn them into fresh eggs?"

★ ★ ★

A woman will look into a mirror anytime except when she is about to pull out of a parking space.

★ ★ ★

In some of the mountainous country of the nation there are women who grow up without ever having worn shoes, and whose feet become so calloused and hardened that they can walk over the sharp stones in the roadways, through creek beds and brush without ever feeling pain.

It is said that on a cold, wintry day an old lady with a corn cob pipe hanging out of her mouth stood leaning against the hearth. After a while her husband motioned her aside. When she didn't move he said, "Step aside, Maw, you're standin' on a live coal."

Leisurely, she puffed away and glanced toward him asking, "Which foot, Paw?"

—*The National Grange Monthly*

★ ★ ★

You are only young once,after that you must think up excuses.

New Approach To Flock Health Management

Flock health pays off in top egg production and low mortality . . .

Condensed from Poultry Tribune

Glen H. Snoeyenbos

HOW much do disease problems really cost the poultry industry? Actually, no one knows the annual bill.

Informed guesses indicate that the average mortality of pullets during the growing period ranges from 10 to 15 per cent. A further loss of about 20 per cent occurs during the laying year.

Loss of egg production as a result of diseases adds substantially to the total loss. Although the actual dollar loss as a consequence of poultry disease is not known, there can be no doubt that many millions of dollars are involved.

Can the losses caused by diseases be reduced substantially? It seems somewhat silly to raise this question for the answer must be given in a resounding figure.

We raise this question because it seems that a substantial segment of the industry feels that poultry diseases are now controlled about as well as possible with our present knowledge and tools. This appraisal commits us to a holding action of trying to put out with some magic medication any disease fibre that may occur. This appraisal has prevented much of the industry from adopting a comprehensive, positive, and aggressive approach to the health problem.

I do not mean that drugs should not play an important role in health control. Most drugs have performed spectacularly. Many of them were only a dream 10 years ago. The tremendous volume of drugs used for treatment serves to emphasize

Reprinted by permission from Poultry Tribune, Mount Morris, Illinois

the basic failure of the industry to produce and maintain healthy stock. It seems probable that health problems curtail production more seriously than do genetic or nutritional limitations.

The time has come to exploit all of the opportunities of controlling flock health by preventing rather than treating diseases. The many recent changes which have tended to increase flock size and centralize management have improved this possibility.

It has, of course, always been necessary to tailor management practices to the size and nature of the enterprise. This is generally true in practices relating to health control. The development of true mass production techniques in egg production has made it economically practical as well as necessary, that we develop a sincere, comprehensive, and long range program to prevent poultry diseases. Greater centralization of control helps to make possible the necessary scientific direction of such a program. Large flocks help keep the per bird cost at a reasonable level.

Although a detailed plan of operation cannot be presented at this time, it is fairly clear that a number of approaches must be used. Some or all of the following methods and others may be used to improve the general poultry health picture.

Develop Disease-Free Stock

By long habit backed by firm logic, we have accepted the absolute necessity of breeding only from pullorum-typhoid free stock. There was much criticism early in this control program.

About 45 eggs out of every 1,000 laid never reach the market. In times of low egg prices, this costly breakage may spell the difference between profit and loss.

The test was criticized for not being entirely accurate, which was and still is true. It was feared that stock free of pullorum infection would soon become so genetically susceptible that it would be dangerous to maintain under normal field exposure. Today, no one will question the outstanding success of the program.

Today, we use the same objections to eliminating other egg transmitted diseases from our breeding stock that were being used almost a generation ago for pullorum. While an appreciable degree of genetic resistance to the ravages of many and possibly all diseases could be developed, it would place a nearly impossible load on the geneticist.

It seems clear that genetic control of diseases should be used only if there is no other practical

approach. A long term program to develop a breeding nucleus of more nearly disease-free stock is indicated. Several of our most serious diseases can be prevented in commercial flocks only if clean stock is available.

Producers Must Cooperate

It is unfair to hold the breeder alone responsible for developing strains of birds free from more of the common egg transmitted diseases. The attitude of the commercial egg producer has not encouraged such an effort. If disease free stock is produced, it must be reared and maintained under conditions that will give it a reasonable opportunity to maintain this advantage. The breeder quite correctly asks himself if stock free from a disease such as CRD (chronic respiratory disease) might not gradually become more susceptible to damage by this disease.

If this is true, clean stock would be undesirable under conditions of exposure to infected stock. Clean stock would have to be raised and maintained separately from infected stock. Such a practice was necessary for pullorum clean stock as well as for eliminating any other contagious disease.

Although it is not certain, it does seem likely that stock free of most egg-borne diseases could be developed. Such stock undoubtedly would have a great advantage in production. Perhaps the biggest question is the willingness of the industry to take the necessary care and to make the necessary adjustments to take full advantage of such superior stock.

In England, there are about 20,000 children of wealthy families who do not live at home, but are taken at birth to special "Baby Hotels" where they are cared for till they are ready to enter school.

Maintain Stock in Isolation

Maintaining stock in isolation is not nearly as difficult or impractical as it sounds. All that is necessary is to start birds on a disease free farm and then refrain from bringing or allowing infection to be brought to them. It is usually man, never lady luck, that is responsible for spreading contagious diseases from flock to flock.

It is seldom practical or possible to maintain isolated units on a small farm with many age groups. It is both possible and practical to apply this principle to many large units such as specialized replacement or laying operations. This approach will become more necessary and rewarding as more nearly disease free stock is being developed.

One Age Group on a Farm

From a health control standpoint, one age group on a farm from a single source is an ideal. The common "all-in, all-out" broiler growing schedule allows complete clean up between lots. The danger of carrying health problems over from one group of birds to another is minimized.

The fact that this is not always possible in a market egg enterprise does not change the ideal. The point that a compromise may be necessary means only that the ideal should be approached as nearly as possible. If it is essential to maintain several age groups, then carry no more than necessary. Whenever possible, maintain different ages in separate buildings or at least in different pens.

Stilbestrol adds about 11% profit. For cattle on a non-stilbestrol 1949 ration, gain cost $22 cwt. On a 1959 ration with stilbestrol, gain cost $19 cwt.

—Farm Facts

The large growth of the started pullet industry creates special health problems. The practice is contrary to the sound and long accepted practice of introducing only baby chicks. Adding started pullets to a laying flock population has greatly increased the disease hazard. The practice demands unusual care to avoid serious trouble.

Test for Flock Immunity

I would like to suggest testing for flock immunity. Again, we are considering a practice that is practical only in a large scale operation. For the most part, we now vaccinate and revaccinate until we hope a flock is adequately protected.

Shouldn't we consider the possibility of vaccinating as appears necessary and testing flock immunity to determine if the program has been successful? Unprotected flocks, which are not rarities, may be revaccinated to avoid costly laying house infections.

It is possible that a reasonably dependable program of immunity testing can be developed for coccidiosis as well as for the common respiratory diseases. Pullets known to be immune to these diseases should command a sufficiently higher price to bear the cost of a privately financed testing program. A premium of several cents per bird would support a rather elaborate testing program of this type for a large group of birds.

Use Present Knowledge

There are, of course, many unknowns concerning health problems. A relative handful of researchers have made a remarkable contribution to the useful

knowledge of poultry health control. Much more needs to be done. It is a mistake, however, to concentrate our attention on the unanswered questions. The fact is that present knowledge is far in advance of present practice. Although methods and techniques may change, the basic bread and butter of health control has not and will not basically change.

Good Management Still Important

The need for continually reducing production costs has been used as an excuse to relax some of the time proven methods of health control. In some instances such changes can be justified. At the same time, it is obvious that such relaxation of safeguards can be very dangerous and costly. Low mortality and high productivity remain essential for an economical operation. It can be a great mistake to save by ignoring the necessity of sound health management only to lose much more by decreased productivity of unhealthy flocks.

If the poultry health situation is to be improved, we will have to discard our present too often "catch as catch can" approach and make a genuine effort to apply proven principles, develop additional techniques, and use a comprehensive scientific approach to the problem of disease control.

Efficiency is Key Factor in Dairy Enterprise

Rising operating costs place a premium on efficiency in operating a dairy enterprise. G. A. Williams, Purdue University extension dairyman, suggests these herd management practices:

Grow and feed early cut forage, harvested with little or no weather damage. Excellent hay is worth $25 per ton when fed to a cow producing 10,000 pounds of milk annually.

Feed concentrates according to the daily milk production of each cow.

Allow each cow a dry period of six to eight weeks.

Fertilize and renovate pastures and follow a system of rotation grazing.

Follow a herd health program.

Raise two heifers calves yearly for every seven cows in the milking herd for herd replacements. Replacements should be the offspring of proved sires and dams with records of 10,000 pounds, or more, of milk yearly. —*Extension Service*

Chimney Smoke

by Irene Rudie

Plant flowers, that thou may'st have perfume . . .
and to give;
Plant cabbages, that thou may'st eat and live,
For life is complex, and its needs demand
That flowers and cabbages go hand in hand.
— Author unknown

A flower bed in the front yard is like a gay handkerchief waved in friendly greeting to the passer-by.

★ ★ ★

Jams and jellies made from the wild fruits — chokecherry, blackberry, or highbush cranberry—are the first to disappear from the cellar shelves.

★ ★ ★

Do you know that red cabbages grow red cabbage worms, and worms in the pink-fleshed apples are pink.

★ ★ ★

Dresses that button down the front were never designed for women with lap children.

★ ★ ★

"May you never see the bottom of your flour barrel," is an old wish for a new bride, but few brides today have even a flour bin in the kitchen. "May you always have a coin for a loaf of bread," might be more suitable.

Another old wish, "May there always be smoke in your chimney," could be changed to "May you always have a well-heated home," but it lacks the nostalgic overtones.

★ ★ ★

Besides saving for the proverbial rainy day, it's a good idea to set something aside for the showers that are sure to come in June!

★ ★ ★

It is said that an individual's chance of being interviewed for one of the national opinion polls is about the same as his chance of being struck by lightning.

★ ★ ★

With the ending of the school year, dinner on the farm returns to noon, instead of night, but most days have two dinners.

★ ★ ★

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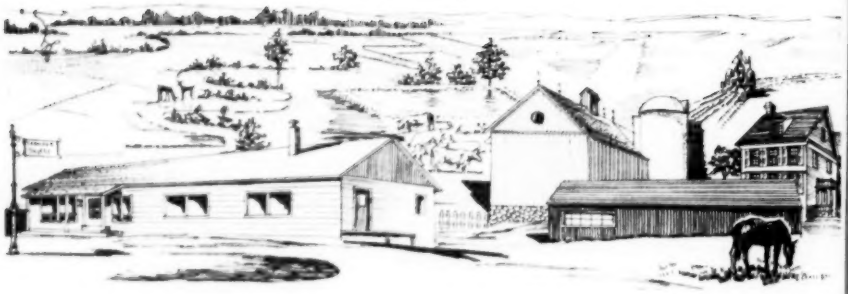

Here's a sketch of our farm where we publish Farmer's Digest. Our 200-acres are planted to corn, alfalfa, grass and trees. We farm — and we publish our magazine on a farm — because we believe that's the only way we can know what other farmers want to read. Farmer's Digest is probably the only farm magazine in the world published on the farm by farmers.

Livestock Poisoning

Don't poison the cattle on your farm . . .

Condensed from Breeder's Gazette

ACCIDENTAL poisonings, most of which involve farm chemicals, are much more important causes of livestock losses than you may think. The estimated annual loss is $4½ million in cattle and $500,000 in swine.

Prevention? Use proper safeguards to keep poisons away from livestock.

Some poisons may act quickly in causing death. Others may build up slowly and produce less serious, but profit-taking results.

ARSENIC POISONING may be caused by white arsenic, paris green and sodium arsenate. These are often used as solutions, sprays or dips to kill insects, parasites, weeds and rodents. Arsenic compounds are usually tasty to animals. Cattle may eat toxic amounts on sprayed weeds, discarded boxes which contained arsenic, buckets or barrels used to mix the compound or poisoned bait being used to control grasshoppers or rodents.

Signs of *acute* arsenic poisoning include severe abdominal pains, drooling, scours, depression, weakness, incoordination, posterior paralysis and convulsions preceding death. You will see serious irritations on the skin of animals who have come in direct contact with the poisoning.

Symptoms of *chronic* arsenic poisoning closely resemble those of other diseases including loss of weight, digestive upset, red mucous membranes, scours and depression.

There is no successful treatment for animals poisoned with arsenic. In the case of chronic poisoning, removing the source will prevent death.

FLUOROSIS, or fluorine poisoning, usually results from animals eating small amounts of the chemical over a long period of time. This *chronic* condition occurs when livestock are fed mineral mixtures containing rock phosphate, have access to water high in fluorine or eat forage growing near industrial plants

Reprinted by permission from Breeder's Gazette, Columbia, Missouri

which discharge fluorides into the atmosphere.

Cattle are most susceptible to fluorine poisoning, with sheep and swine following in that order. Symptoms of chronic fluorine poisoning include a mottling, staining and excessive wearing of permanent teeth, lameness, dry skin, scours, abnormal hoof growth. In the *acute* form, signs may include scours, sudden loss of appetite and loss of weight.

There is little hope of overcoming the damage of this poison, but feeding liberal amounts of calcium and phosphorus or aluminum compounds will sometimes prevent accumulation of fluorine in the teeth and bones.

LEAD POISONING is the commonest form of metallic poisoning in livestock. While many lead compounds are insoluble in water, they may dissolve rapidly in the digestive juices in the stomach. Stock may chew or lick

Tobacco is a member of the same family as the potato, tomato, petunia and garden pepper.

newly-painted buildings, paint-lined buckets or troughs, discarded paint cans, lead storage batteries and discarded painting equipment.

Cattle are most often affected by lead poisoning. There are two *acute* types of this poisoning, one affects the lining of the stomach and intestines, and the other affects the nervous system. In the first type, signs include loss of appetite, scours, grinding of teeth and drooling. In the second type, the animals walk in circles and bump into objects because of blindness. Cattle may bellow in a strange tone of voice. Signs of chronic lead poisoning include loss of weight, depression, staggering gait and alternating scours and constipation.

U.S. Department of Agriculture researchers say releasing male mosquitoes sterilized by irradiation with cobalt-60 is experimentally effective in reducing numbers of malaria-carrying mosquitoes.

Veterinarians treat lead poisoning by administering elements which help change the soluble lead in the stomach into less soluble form so it won't be absorbed so readily.

MOLYBDENUM POISONING becomes a problem when livestock graze areas where molybdenum from the soil has become concentrated in excessive amounts from plants. Alfalfa and clovers generally take up more of the chemical than grasses.

Cattle and sheep are most susceptible to molybdenum poison-

ing. Young cattle are more susceptible than older animals, and dairy cattle more susceptible than beef or sheep. Swine and horses are resistant. Signs include scours, emaciation, anemia, weakness, stiffness and fading of the hair coat. Death may result from prolonged scours.

Controlled amounts of copper sulfate and cobalt carbonate have proved successful as treatments.

Research that would reduce costly livestock diseases needs to be increased.

The most common sources of NITRATE POISONING are nitrate fertilizers and certain plants such as redroot, Russian thistle, white ragweed and variegated thistle. Nitrite is formed from the nitrate after it enters the digestive tract. Nitrite, absorbed in the blood stream, prevents red blood cells from carrying oxygen to the tissues.

Cattle, sheep and horses are susceptible to nitrate poisoning, but most cases are seen in cattle. Symptoms include staggering gait, muscular tremors, blue mucous membranes, rapid and labored breathing, dilation of the pupils and coma.

Intravenous injections are used to permit the red blood cells to carry oxygen to the tissues of the affected animals. Mineral oil also helps reduce the absorption of the nitrate and aids in its elimination.

Nearly all classes of livestock may be affected by SALT POISONING, but sheep and swine are most often stricken. Signs include extreme sensitivity to touch, loss of appetite, red and dry mucous membranes of the mouth, convulsions, inco-ordination and paralysis.

Giving the affected animal a large volume of water and mineral oil may help in some cases.

Chronic SELENIUM POISONING may affect cattle, swine and horses. Cattle and sheep are likely to develop the "blind staggers" type. Signs of *chronic* or "alkali disease" in horses include loss of hair of the mane and tail, in cattle loss of switch, rough horns, deformed hoofs and sloughing of the hoof, and in hogs loss of hair. Affected animals may become sterile or slow breeders. Symptoms of the "blind staggers" type in cattle and sheep include wandering, impairment of vision, poor appetite, weakness of front legs, paralysis, below normal temperature and labored breathing.

There is no satisfactory treatment for selenium poisoning.

Remember, keep poisons away from farm livestock. If symptoms do appear, call the veterinarian to find out which condition exists.

Vaccination Will Halt Spread of Leptospirosis

It is damaging to milk production and causes heavy losses in beef herds . . .

Condensed from Missouri Ruralist

Cordell Tindall

LEPTOSPIROSIS is ranked third among diseases of livestock in this country. There is no really accurate check on just how many herds are infected but reports show the disease is widespread, with the problem being more serious in some sections than others.

Doctor Rosner, Missouri State Veterinarian, hazards the opinion that leptospirosis is more damaging to milk production of dairy cattle than mastitis, the long-time foe of dairymen.

The disease has caused heavy losses in beef herds, too, chiefly from loss of calf crops from abortion.

There is no organized campaign to halt leptospirosis—but fortunately vaccination is an effective control. Individual livestock owners have been quick to act in most cases when herds have become infected. Veterinary officials feel the disease could be brought under control. Vaccination is effective and the nature of the disease suggests that the problem could abate some as the disease runs its course.

Just what is this disease leptospirosis that is causing so much concern? It has made a rapid appearance in most states. It can strike a herd of cattle or hogs suddenly, without warning. When reported in a community, livestock owners of the area naturally are concerned and there arises the problem of what should be done. When should we vaccinate?

For answers to these questions let's consult Dr. C. J. Bierschwal, of the staff of the School of Veterinary Medicine, University of Missouri, Columbia. He recently appeared on the program of the "Beef Cattle Breeders' Short Course" at the Missouri College of Agriculture. His report to cattlemen is of interest to swine breeders, too.

All of the following informa-

Reprinted by permission from Missouri Ruralist, Fayette, Missouri

tion on leptospirosis was included in his talk:

"The leptospira organism is a thin, twisted, corkscrew organism infecting mainly the kidneys and sometimes the liver. There are more than 40 different species of this organism, but only a few are important to cattle and only one of extreme importance and that is Leptospirosis pumona.

Stable flies can cause a 10 to 20 per cent decline in milk production.

How Lepto Disease Spreads

"The disease is spread thru infected droplets of urine coming in contact with cuts, abraded skin, membranes of the eye, nose and mouth . . . Another source of spreading is thru fetal membranes and dead feti (immature calves and swine) of infected animals. It can also be spread thru the milk in calves where the udder is affected."

It has been thought the disease seldom was spread orally, but Doctor Bierschwal suggests cattle sometimes may get the disease by eating the organism.

Rodents also may carry the disease from one farm to another.

"Leptospirosis is a most difficult disease to explain to livestock men," comments Doctor Bierschwal, "because it may vary from a mild condition that may go unnoticed to a very serious infection that can result in speedy death of the animals.

"It has been called a 'warm weather' disease because usually there is a higher incidence in spring, summer and early fall, but it can occur any time of the year. All animals in 5 to 7 days after exposure will show a rise in temperature. This may go unnoticed and have little effect on the general appearance of the animal. Other animals may show a noticeable depression or listlessness and lack of appetite—go 'off feed'—in the early stages of the disease when the organism is in the blood stream. After this stage the animal may recover or one of the following may occur:

"Abortion—many times in a herd abortion will be the only symptom. A cow may merely expel the immature fetus, before her time is up, usually in the later stages of pregnancy. Afterbirth or placenta usually will be retained. Sometimes the cow will carry the calf to full term, but the calf will be born dead or weak and die.

Mastitis Occurs Differently

"Mastitis of leptospirosis: Mastitis caused by this disease is quite different from usual infection of the udder. Usually, there is a sudden and almost complete stoppage of milk flow and the small amount of milk produced

is thick, yellowish and may resemble colostrum or may appear like cloudy honey. The udder becomes soft and limp like that of a 'dry' cow. There is no swelling or pain that usually is present with other mastitis. At times there may be bloody milk or blood-tinged milk. Milk production usually returns to normal in 10 days to 2 weeks in the cow that recovers.

"Passage of discolored urine: Passage of coffee-colored urine, or bloody urine, is not uncommon in cows infected with leptospirosis. If red in color this usually means the animal is passing blood, but a coffee color indicates that red cells of the blood are being broken down and passed.

"Yellow color of membranes: Yellow coloring of eyes, nose, mouth and vulva is not as common in cattle infected with Leptospirosis pumona, but is quite common where the other form of Leptospira icterohemorrhagica is present."

Leptospirosis in hogs is some different than in cattle, in that sickness seldom is noted and about the only symptom is abortion. There is little, if any, mastitis, bloody urine or coffee-colored or bloody urine.

How, then, can a livestock producer determine whether his animals are infected?

Use a Blood Test

Fortunately, there is a common and practical test—a blood test. It is similar to a brucellosis test. It's highly accurate when taken at the right time, but Doctor Bierschwal warns that it is possible for animals to have the disease and to give a negative test. Best time to run a blood test is when the animal shows the first symptoms and then again in 2 weeks. Better, more accurate tests are promised.

Antibiotics are effective in treating the disease, but when animals are acutely ill such treatment may be of little value. However, it is important to know that proper treatment often will prevent a sick animal that recovers from being a carrier.

Vaccination is the biggest and most helpful tool to halt the spread of the disease. This brings up the question as to when to vaccinate. Doctor Bierschwal suggests vaccination of all animals under these situations:

1. When abortions are caused by the disease or when there is an outbreak in the herd.

2. On farms where there is a large turnover of livestock. There's danger of bringing in a carrier animal that appears normal.

3. When the disease appears on adjacent farms.

4. For animals that are being

shown at fairs and livestock shows.

5. When animals are added to a herd that already is infected or has had the disease previously.

6. When cattle and hogs are run together, the cattle should be vaccinated.

A Canada thistle plant bears either male or female flowers. The male plants do not produce seed. The female plants produce seed only if fertilized by pollen from a male plant.

How long does the vaccination last? Normally it is thought to last at least a year, but when infected herds are vaccinated they should be revaccinated every 6 months until no new cases of the disease appear, then a yearly vaccination is sufficient.

The disease is more severe in calves, also the immunity is shorter lived in calves. Death losses may range up to 25 per cent in younger animals. Losses of 5 per cent are more common in older animals.

The vaccine used to control "lepto" is known as a dead vaccine. So there is no danger of infecting animals not vaccinated.

Vaccinate Entire Herd

When the disease hits a herd of cattle it is suggested that all animals be vaccinated, even calves 2 or 3 weeks old.

A normal control program of vaccination would include vaccinating heifers a month or so before breeding them, then vaccinating once a year.

Naturally, the cost of vaccination may vary, but most veterinarians charge about 75 cents to $1 a head.

How soon after vaccination is the animal protected? Usually it is said that protection is effective in 30 days, but may be as soon as 15 days.

Doctor Bierschwal suggests that new purchases be vaccinated and isolated from the remainder of the herd for 2 weeks.

One final thing about this disease should be emphasized. It affects humans, too. Some deaths have occurred. Several employees of the University of Missouri, at Columbia, were infected. In man it is thought the organism can invade the unbroken skin.

USDA expects 1959 meat production to be about 8% greater than 1958, with most of the increase in pork. This should result in a consumption rate of about 158 lbs. per person—7 lbs. more than 1958 and about 6 lbs. above the postwar average, but appreciably less than the 167 lbs. consumed in 1956.

The Small Dairy Farm How Can It Survive?

You may be better off with less than 30 cows . . .

Condensed from
Michigan Farm Economics

L. H. Brown

LOWER prices for milk! More cost increasing requirements to meet some rigid public health requirements! Forced change to bulk handling! Can the small dairy farm survive this onslaught? If so, how?

The question of survival on a small farm is particularly important to the farmer who has only a few years to retirement and nobody to take over. It is important, also, to those who prefer, for various reasons, not to take on the additional indebtedness necessary for expansion.

Which Small Farms Are Surviving?

To shed more light on the question of which small farms are now surviving we examined 131 southern Michigan dairy farm account records. All records were from farmers milking *less* than 30 cows.

These farms were divided into three groups, according to how well they were able to organize into a profitable farm business for 1957. Let's call them (1) well-managed, (2) average, and (3) poorly managed. The poorly managed group includes those with less than $1.00 income per dollar of expense. The average group had $1.00 to $1.25 and the well-managed had $1.25 or more of income per dollar of expense.

On this basis 21 per cent of the farms were poorly-managed, 40 per cent were average, and 38 per cent were well-managed. In a similar study of larger dairy farms a higher proportion were in the well-managed group.

The final measure of "success" used here was labor income. That is what the farm operator had left for his labor and management after deducting from gross income all expenses, including depreciation on machinery, buildings, fences and tile, deducting an allowance for unpaid family

Reprinted from Michigan Farm Economics, Michigan State University, East Lansing, Michigan

labor (other than the farm operator) and deducting five per cent on the total investment.

Well-Managed Farms Have More Cows

The poorly and well-managed farms have about the same amount of land with the average group a little less. The well-managed group has 14 per cent more cows than the poorly managed. They care for these cows with 19 per cent less labor and sell 15 per cent more milk per cow with 7 per cent less feed. They grow almost 30 per cent more feed per acre with only 13 per cent more spent for seed and fertilizer.

The well managed farms have 52 per cent more gross income per acre with 6 per cent lower expenses. They have 13 per cent less farm business investment per cow which is reflected in lower building and machinery expense per cow.

These kinds of differences between poorly and well managed farms are in line with the often repeated rule that "good farm management is doing many ordinary things extraordinarily well."

Can Poorly Managed Farms Improve?

Most of these who drop from the ranks of dairy farmers will be from the poorly managed groups. Some of this group will make necessary adjustments and survive. Changes needed vary from farm to farm but these include accomplishment of some or all of the following:

1. Higher crop yields.
2. Higher producing stands of hay and pasture and wheat.
3. A few more cows.
4. Higher producing cows.
5. Foregoing investment in labor saving equipment, the capacity of which exceeds the size of their unit. This includes such items as pipeline milkers, silo unloaders, larger combines, corn pickers, forage harvesters and other items that push machinery investment past $60 per tillable acre.
6. Making machinery last more years or buying good used equipment and making it do.
7. Owning expensive equipment with a neighbor.
8. Making present buildings do with a bare minimum of new investments — Remember that when you start building silos, pole barns, milking parlors, etc., there is frequently no good stopping place short of 60 to 80 cows!

Dairy cows will take an average of ten drinks a day if they have free access to water. The average dairy cow will drink about 15 gallons of water a day, and a heavy milk producer may need as much as 40 gallons.

9. Having a gross income of $90 to $110 per acre while keeping expenses in the range of $60-$80, (including depreciation and the value of operators and family labor.)

10. Organizing the business to gross at least $10,000 to $12,000 per man. This means keeping 20-30 cows per man and maintaining good yields on 110-140 acres on these smaller farms.

Staying Competitive Not Easy

Some farms will stay small and do the things necessary to stay competitive. Once yields, livestock production, land, labor and capital are in balance one must use care and caution to stay in balance. There will continue to be downward pressure of dairy product prices and upward pressure on expenses to tempt good farmers to try to take the smaller margin of profit per cow on enough more cows so that the net family income will be maintained or increased.

Today about 17 minutes of working time will buy a dozen eggs, compared to 40 years ago when it took 87 minutes.

Keep in mind, however, that if your farm business is now in balance at about the 20 to 30 cow level and you start to move up a few cows in size, you are likely to find no point of balance short of 60 to 80 cows.

Paraffin for Trench Silo Walls

An agricultural engineer on the management staff of a large New England farm reports an interesting and perhaps significant experience in the use of high melting-point paraffin on concrete silo walls.

Last spring the walls of two trench silos were coated with the paraffin, and though these silos have sloping rather than vertical walls, there was no need for use of a hand fork at any time as the silage was removed. The paraffin appears to be relatively inert and, as this engineer puts it, its friction coefficient is comparable to that of a cake of soap in a bathtub. Also it seems to lubricate the contact points of the tines on the tractor loader sufficiently to prevent gouging the concrete floor of the silos.

This engineer believes there may be a number of machinery and building surfaces which would benefit from the paraffin treatment—but, he warns, never, never apply it to a traffic surface; one of their silage trucks failed to negotiate a 4-inch curb that had been treated inadvertently. —*Agricultural Engineering*

Let's Look At The Beef Carcass

A livestock specialist discusses late trends in the merchandising of beef and considers the future . . .

Condensed from The Shorthorn World

Prof. E. A. Kline, Iowa State College

I want to first point out that as beef carcasses are merchandised at the present time, we are finding an increased trend in breaking the carcasses down into various wholesale cuts. In the past, the meat processor has merchandised beef pretty much in the carcass form. Of course, it was broken down into quarters to facilitate handling, but the trend now is to merchandise this carcass more and more into various wholesale cuts.

We could take our beef carcass and pretty well divide that carcass into four rather equal parts. The round and rump represent, on the average, 24 per cent of the carcass. The rib and loin together represent about 26 per cent of the carcass. The chuck, the forepart of the carcass, represents about 26 per cent of the carcass. The flank, the brisket, the plate and the shank, which, if we added it together, will represent about 25 per cent of the carcass. So roughly, we could take this carcass and divide it into four rather uniform parts, the rump and round, the rib and loin, the chuck and then the cuts down along the lower part of the carcass. It is surprising that the carcass breaks down as evenly as it does into four parts.

To look at the value of some of the wholesale cuts, based on National Provisioner figures, which is the packers reference book, here is what we find. On the average for Choice round and rump, the price from July 1st, 1957, to June 30th, 1958, has been 51 cents a pound. That is wholesale price. The average price for Chicago beef as far as the loin is concerned, which represents 17 per cent of the carcass, has been 74 cents per pound. The average price for rib, 58 cents a pound; for chuck, 39 cents for the plate, ribs and shank 25 cents; and for the flank 20 cents. If we take three cuts, the round and rump, loin and rib, they represent about 50 per cent of the carcass. In the case of the Choice beef, it rep-

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resents 66 per cent of the value of the carcass, two-thirds of the value of the choice carcass is in the one-half of the carcass, along the back, the rib and the loin, the round and the rump.

In comparison, let's take a look at the Prime beef grade. If we take the average price figured for Prime at the same period of time instead of 74 cents per pound for the loin, it averages 98 cents. For this same period of time, the price of ribs from Prime beef was 68 cents; round and rump was 52 cents. In the case of the chuck, we have the same figure here. Prime grade chuck was selling for the same price as Choice grade chuck. In the case of flank, it again is pretty much the same picture, 20 cents for flank grading Prime and 25 cents for Prime beef cut from the front end. So that the difference between a Prime carcass and a Choice carcass, as far as value of the wholesale cuts are concerned, is primarily in two cuts—the ribs and the loin, because the wholesale price of the other cuts did not change.

Now you may wonder about the next lower grade, Good grade beef. If we take Good grade and look at the average price of loin, it was 64 cents on the average for the 12-month period, 10 cents less than Choice; for ribs it's not quite as drastic, 51 cents for Good grade ribs compared to 58 cents. The round is pretty much in line with our other figures, 49 cents for Good grade round and 39 cents or the same, for chucks on Good grade carcasses. When we look at the various price differences of the different cuts, we find that one-fourth of the weight of two cuts, the rib and loin, determine the difference in the price between Good and Choice, or Choice and Prime beef, taking into account, of course, they have a little difference with regard to dressing percentage. One point I want to leave in mind before we move on is that the rib, loin, round and rump represent one-half of the weight of the carcass; in the case of Choice, they represent two-thirds of the value of the carcass; and in the case of Prime, they represent about 70 per cent of the value of the carcass.

Indiana farmers plan to plant 5,280,000 acres of corn this year. This will be the largest corn acreage in Indiana since 1923.

In 1956, 4 per cent of the cattle slaughtered in the United States were of the Prime grade; 33 per cent of the cattle slaughtered in 1956 were Choice and 21 per cent were Good. In other words, 58 per cent of the total cattle slaughtered in 1956 were

of the top three grades—Prime, Choice and Good. Five per cent of our kill was in the Standard grade, and this will represent primarily our steer and heifer kill. The lower grades are primarily cows and bulls, with an occasional steer or heifer, 11 per cent

A psychologist says women have cleaner minds than man. Maybe it's because they change them more often.

of the cattle slaughtered were Commercial, 15 per cent Utility, and 13 per cent Cutters and Canners. If you will look at the Chicago market, and I know a good many people do, of the steers sold out of first hands in Chicago for 1956, 14 per cent were of Prime grade, 60 per cent Choice (over one-half of the steers were in the Choice grade) 22 per cent Good and only 3 per cent Standard. Keep in mind this is Chicago. Let's come a little closer to the midwest and study the figures for Omaha, which of course, is not the market for highly finished cattle that Chicago has been. We find in Omaha that 2.4 per cent of the steers sold out of first hands, in 1956, were Prime, 61 per cent Choice (about the same percentage as Chicago, but we have considerable more Good grade steers in Omaha than in Chicago), 31 per cent Good, and 4½ per cent falling within the Standard grade.

Looking Into the Future

I am not going to project too far into the future, but let's look back and think where we have been, and again I will more or less leave it up to you as to where we are going. I think that it's rather interesting to note that the percentage of Choice steers in Chicago has been increased consistently from the beginning. In 1920, the USDA grades first came into active use, and since that time Choice cattle have had a rather steady increase. On the other side of the picture, the plain cattle have decreased although they tend to be leveling off at the present time. In Chicago, the plainer steers are representing somewhere around 16 or 17 per cent of the total amount offered for sale. Now as regards Prime steers in Chicago, I am a little bit at a loss to try to explain why that since about 1940 the number of Prime steers has increased and for the last 4 or 5 years they have been running somewhere along 15 to 16 per cent of the total sale in Chicago.

Some reference has been made to consumer demand, I am quite sure that consumer preference has made possible the increase of Choice cattle. I am not too sure that consumer preference

had a factor on the plainer grades, but at least they are holding their own.

We have pointed out the different grades that we have in beef. At the present time we have eight grades of slaughter cattle — Prime, Choice, Good, Standard, Commercial, Utility, Cutter and Canner. I am going to stick primarily to the grading standards as set forth by the USDA. It states that only steers and heifers are eligible for the Prime grade. Let's consider for a minute the factors that go into determining a grade—you've all judged animals on the hoof. You have all talked about conformation, finish and quality. Well, the same holds true in the grading of beef. Different emphasis may be placed on some of these factors than on others, but the top two grades, Prime and Choice, are set up primarily as quality grades. In reading on the Prime grade it goes into quite a discussion regarding conformation of the carcass being blocky, thick and full, etc. and then it says this: "Regardless of the extent to which other grade factors are present, a carcass must have certain evidence of quality to be eligible for the Prime grades. The cut surface of the muscle must be firm, fine textured and bright in color, slight amount of marbling must be evident in the rib eye with soft red chine bones terminating in soft pearly white carcasses." In the case of Prime, we want to keep in mind that the percentage of production is not great in this grade and that it is primarily directed toward hotel and restaurant supply for outlet as far as loins and ribs are concerned.

Bull's Paunch Yields Maze of Hardware

Here's a story of a bull that acquired hardware disease with a vengeance!

A recent report from the Vermont Extension Service says the animal, when slaughtered, was found to have these things in his stomach: A set of gold bridgework, half an innertube, two plastic bags, nine pennies, a rubber doll, a toy wristwatch, a fishing spinner, five clothespins, six can lids, a 4-inch stack of bobby pins, 24 bottlecaps, two earrings, two hypodermic needles, some small arms cartridge casings, two men's rubber heels, five coffee can bands, one keychain, a broken pop bottle, some safety pins, a gold watch band and 16 nails. Editor's Note: Please don't write for further details.

—*Weekly Western Livestock Journal*

Baby Pig Losses

Anemia, scours, and TGE are three diseases that cost profit-making dollars . . .

Condensed from Indiana Farmer

BABY pig problems are now costing America's farmers the almost unbelievable sum of nearly a half billion dollars a year.

The toll of baby pig diseases is now so great that a special effort is being made to concentrate preventive steps against them as a special part of the National Livestock Loss Prevention Year program. The list of all these pig problems is a long one, but the three which cause most losses for the average swine producer are probably anemia, scours, and TGE (transmissible gastro-enteritis).

Anemia

In recent years anemia has been looming up larger and larger as a killer of suckling pigs. Our soils are becoming increasingly deficient in iron and copper and the American Foundation for Animal Health cites this as one of the reasons. Also, immense numbers of pigs are farrowed in the cold months when they do not have access to pasture.

Indications of pig anemia include listlessness, weakness, pale membranes in the mouth, lips, snout, and around the eyes, and loss of appetite. Many times anemic pigs appear thrifty but become tired after even slight movement. Those pigs which do not die of anemia probably will never be thrifty.

The best way to cope with the anemia problem is through a preventive program. One of the newest methods of prevention is to have a veterinarian inject an iron solution into the pigs' muscle tissue. This works quite successfully. Other methods include giving iron and copper tablets, painting the sows' udders with a solution, or placing sod in the pen. However, the sod method is not as popular as it once was because of the deficiency of iron and copper in some soils.

Scours

Scours ranks right up with anemia as a top cause of baby pig losses. It is believed to kill as many as seven to ten million

pigs a year. Scours can be caused by a number of viruses and bacteria, or it can also be brought on by inadequate or unbalanced rations. However, pigs chilled at birth or kept in unsanitary conditions or born to a sow which has inadequate rations or which is overfed, are more likely to be affected.

Treatment of the disease depends on first finding out which type of scours the pigs have . . and this usually calls for diagnosis by a veterinarian. However, in all cases, immediate steps should be taken to see that pigs are kept in warm, dry, sanitary quarters, and that the sow gets good, balanced rations.

A successful marriage consists of: (1) finding the right person; (2) being the right person.

TGE

TGE, or transmissible gastroenteritis, is probably one of the most rapidly fatal baby pig diseases existing in this country today. When it strikes pigs less than 10 days old, the death rate may reach 100 per cent. It is caused by a virus and may be transmitted from an infected sow to her new-born pigs. Signs of TGE include loss of appetite, scours, depression, squeals of pain, emaciation, vomiting, rough hair, dehydration, coma, and rapid death.

So far, there is no medical treatment for TGE.

Even prevention is difficult in dealing with this disease. Stringent measures of maintaining a closed herd or buying only replacement stock which is 100 per cent clean are the surest ways of keeping TGE off the farm.

There are a number of other causes of baby pig losses such as goiter or hairlessness, uremic poisoning, hypoglycemia, edema, brucellosis, leptospirosis, overlying, vitamin deficiencies of pregnant sows, an absence or deficiency of milk in the sow and respiratory infections. The list seems almost endless. The cost runs into the hundreds of millions.

The most important thing for the farmer to remember in dealing with baby pig problems is that so many of them resemble one another, according to authorities of the American Foundation for Animal Health. With "look-alike" diseases such as these, it is easy to guess wrong. Where there is a question, it is best to have a diagnosis made and then proceed accordingly. The resulting savings in pigs, and in money can be quite substantial.

A sure way to locate missing relatives is to die rich.

When It Hurts

Many people will say that they are "allergic" to bee stings. But are they?

Condensed from Gleanings In Bee Culture

Robert J. Wyndham, Upland, California

NEAR where I live, a heavy truck swerved down the street, its brakes screeching. It jumped the curb and went through a store front. The truck driver was badly hurt and the property damage considerable. Officially the cause was listed as a bee that had entered the driver's cab, which caused the trucker to lose control. The real cause was that the driver panicked, while he was swinging at the bee. Accidents of this sort are not uncommon and they are 100 per cent avoidable.

Every beekeeper knows that bee stings are often caused by instinctive fear. When a bee lands on you, in nine out of ten cases it has not come to sting you. Perhaps it is tired ("My wings are killing me!") and you look good as a landing strip. Or maybe it is just exploring you and it peacefully enjoys a sniff. Of course, if you get frightened and you swing at it, it will feel threatened. Then it stings you at the cost of its life.

Bees away from home are not likely to sting, unless they have been enraged before by someone. Time and again beekeepers are asked, "Do the bees ever sting you?" Often people ask what to do when bees land on them. I nonchalantly advise them to flip them off, being careful not to pinch them. However, if a bee approaches in quick darting movements and swoops down like a divebomber while making a high-pitched noise, it is cross and has murder on its mind. Then whammo: smash it quick with a sliding slap! Before a bee can sting, it has to curve its body, so you can see what it is up to. If it lands on your head, you are in trouble. For then it gets entangled in your hair, feels trapped, gets panicky and then it will give you the works. Never try to get a bee out of your hair: this is a sure way to get stung.

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Swiftly crush it between your fingers, then get the pieces out of your hair.

If that truckdriver had only known that the bee in his cab was much more frightened than he could possibly be! A bee caught in a car is going through a dreadful experience and it has only one thought in mind: To get out! Moreover bees lose their aggressiveness when confined. Glass is unfamiliar to them and you can see them desperately hugging the window panes of a car or a honey house. They think the light will guide them back to the wide open spaces.

So what to do, when a bee gets into your car? You can forget Emily Post and completely disregard your guest. That is, if you are either a beekeeper or cold-blooded. You can be almost sure that it will stick to the glass. But if you feel uneasy, calmly pull up to the curb, open the doors and your hitchhiker is likely to leave, without saying so much as thank you for the ride. I use my stationwagon to haul light loads of combs. Usually a number of stragglers hand on to the combs and many times I have driven my car with a hundred or so bees in it. Never have I been stung while in my car.

Sometimes people want to know what to do when stung. Again this is simple. The bee had curved its body, using the leverage of its hind legs to push the business end of its body onto your skin. Then the daggersharp sting sank into your flesh and the rascal tried to get away. But the microscopic barbs of the sting kept it in your flesh, so it broke off, usually tearing the bee's intestines out. By now the bee is dying and you think you are. The sting, with poison sack attached is all yours now.

After it is torn off, the sting will continue pumping more venom into your system. So you have to act fast. Don't attempt to pull it out: for if you do, you squeeze the poison sack and add

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A furlong was originally a 'furrow long,' or the distance across a square field of 10 acres, or 220 yards, or 1/8 mile.

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to your misery. Just scrape it off with the back of your thumbnail, that's all. Sure, it hurts like the dickens. But the sharp pain will not last longer than a minute, although it feels like a very long minute. Beekeepers have become immune against the swelling which follows in most cases. But if you are a new beekeeper, shortly afterwards you may be sporting a nice little swelling, the size of which depends on where the "disaster" struck. Stings near nerve centers

and on the face give the most spectacular results. But remember now: no cloud so dark, that has no silver lining. Your wife, your friends, all will sympathize with you. And as long as the swelling lasts—one or two days—it is a fairly good conversation piece. True, not as good as an operation. But then, look at the difference in cost!

Dozens of your relatives and friends will suggest sure-fire remedies to combat the aftermath of your short, but mutually unhappy association with *apis mellifera*. Application of vinegar or raw steak are odds-on favorites. Both are of proven merit, provided you apply the vinegar to your salad and the steak to your palate. In earnest: once you remove the sting, there is nothing helpful you can do. The swelling is a normal reaction.

Weather conditions affect mastitis, report Purdue dairy scientists. When the daily average temperature dropped below 60 degrees, there was a substantial increase.

Many people will say that they are "allergic" to bee stings. Asked why they think so, they reply usually that stings cause them bad swellings. Again, this is perfectly normal. However, if any symptoms appear in places where you were *not stung*, then it is time to see your doctor immediately. In rare cases, bee stings will cause difficulty in breathing, heart palpitations, red blotches all over the body or swelling of the ankles. Your doctor will give you a shot of adrenalin or epinephrine and soon you will feel as good as new. Bee stings can be dangerous to people with heart trouble. Some very rare cases occur, where a person is extremely oversensitive to bee stings and "passes out." This is serious and a fast trip to the hospital is indicated. Recent research has shown that this severe reaction is not caused by the bee venom, but by the tiny amount of bee protein which comes with it.

As a rule bee stings are harmless. But if bees are infuriated en masse after an inexperienced beekeeper has stirred them up or when cattle knock over a hive, then a dangerous situation exists. A few years ago a man was clearing brush in California with a bulldozer. He crushed a bee's nest located in a shrub and bees by the thousands landed on him. The victim died. Years ago I was helping a friend taking off honey in a yard located on a stretch of brushland. When we were about to leave, a man walked up and staked a mule very close to the hives. My friend warned him that the mule was too close to the bees, pointing

out that there was plenty of room. But the man said it was all right. After lunch we came back to take off more honey. The mule was still there, but dead! He had walked around a hive and his tether had pulled it over. Then the angry bees had stung him to death.

When a person other than a beekeeper (who wears a bee veil and has bee gloves handy at all times) is attacked by a horde of bees, it does not make sense to put up a defense. For there is none. If there is a building in sight, run! And try to break all Olympic records. If you have no such luck, duck into shrubbery, head and hands first. If there is no shrubbery around, lie down on your stomach, cover up your head with anything you can grab, weeds for instance. Then hide your hands under your body. Wait a long time, till the sound as well as the fury have died down.

Beekeepers have learned by the accumulated experience of thousands of years, how to avoid angering the bees. They handle all the hive parts very gently, carefully avoiding fast or jerky movements. They know that a change in the weather makes bees short-tempered. They also know, that they s h o u l d not breathe into the hives, smell of liquor or medicine or wear dark clothes. They know better than to stand in front of a hive and interfere with the bee traffic. Beekeepers recognize the symptoms of an oncoming mass attack and forestall is with smoke. As a result a beekeeper does not get stung too often. When bees are working hard to haul in nectar, they are happily preoccupied with their task and they are not apt to sting, unless provoked.

Just as the disposition of humans varies widely, so the temper of one colony is different from another. Then some days they are very gentle and they seem to take almost anything in their stride. But when a nectar flow suddenly gives out, they seem to be waiting for someone to take it out on. Also, different strains of bees vary in temperament. Unfortunately the more stingy strains of bees are sometimes the most productive.

Gasoline vapors not only are invisible, but are also three times heavier than air. Place your gasoline tanks outside of buildings so fumes cannot collect in large quantities.

Beekeepers receive a curious but valuable dividend from bee stings: immunity from rheumatism and arthritis. For centuries it has been known that bee stings sometimes cure these afflictions. Extensive research by the

late Dr. Bodog F. Beck of New York City has established that there is no case on record of a beekeeper suffering from arthritis or rheumatism. The venom is also extracted for injections by the medical profession. It is recognized as a medicine in the American Pharmacopoeia, the pharmacist's bible.

If you inspect a bee sting after you have scraped it off your skin, it does not look very intriguing. But you would be surprised, if you could see this tiny speck under a microscope. It is a masterpiece of nature's art; a complex apparatus, mechanically the ultimate of efficiency. The main parts are two spearheads, much sharper than the finest needle, barbed along the edges. The whole is neatly enclosed in a sheath. It is flanged, grooved and polished. It is probably more perfect than the best surgical instrument.

More than one-third of the liquid financial assets of U.S. farmers are now in Savings Bonds.

How it does its job? When the point of one spearhead is in the flesh of its victim and the barbs have taken a hold, the attached muscles force the other spearpoint in. From then on the spearheads alternate: one point holding on to the flesh while the other one digs in deeper. The murderous little weapon will go on pumping venom for minutes after it is torn off the bee's body, as if it had an existence of its own. Muscular contraction of the sting has been observed under the microscope 20 minutes after the sting was severed from the bee!

Today missiles are almost a household word. So it does not sound too strange that in ancient times bees were used as unguided missiles. Appian, a historian of the second century A.D., gives an account of the Mithridatic War. He tells how the army of the brilliant Roman general Lucullus was defeated by the intelligent use of bees. In the Middle Ages beehives were often kept on the walls of fortified cities. Not only was the flightline of the bees out of the way of traffic, but there they came in handy for defense. When besiegers stormed the fortifications the hives were hurled on the enemy. The enraged bees would crawl through the visors of their helmets and the slits of their armor and sting the warriors out of action.

For centuries while the Turks occupied large parts of southeastern Europe, the Danube River was the boundary between East and West. Time and again the European nations tried to

drive the Turks back east. Many of these expeditions failed. One of the defenses the Turks used to prevent the crossing of the Danube, was bees. Montaigne, the master of the French essay, tells how in the 16th century, the besieged City of Tamly, Portugal, defended itself. The inhabitants, using fire, drove the bees out of their hives which had been placed on the city's walls. Infuriated, the tiny unguided missiles swooped down on the attackers and stung them so badly that they fled in disorder.

Salt Good Weapon Against "Water Belly"

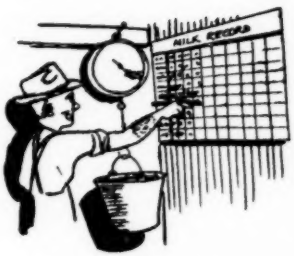
Plain ordinary salt has proved to be a good weapon against water belly, a disease that ranks third as a cattle killer, according to a western survey.

George Strum, North Dakota livestock specialist, reports that researchers have had good results adding from 3 to 5 per cent salt in the concentrate rations. The salt prompts cattle to drink more water which is necessary to flush out the mineral deposits that form and often block the urinary tract.

Strum says that weaning time is when you're likely to have a lot of trouble with water belly—more accurately called renal calculi. The switch from milk to grain upsets the system of some calves. Water belly can strike if cattle are slow to drink water and to utilize feed nutrients supplied before in milk. He suggests that you introduce salt in the creep ration so calves will be used to salt in later rations. The same applies to lambs—water belly is a threat to them, too.

Make sure you have an ample and convenient water supply for stock. Water belly is especially dangerous during cold weather when livestock drink less water, if conditions aren't quite right.

Dr. I. A. Schipper, veterinarian, says to keep your eye peeled for these symptoms of water belly—off feed, depression, humped appearance and frequent straining attempts to urinate. Other signs include a prolapsed rectum and mineral deposits on the preputial hairs. *—Western Livestock Reporter*



You Get More Milk Using Cow Psychology

A little consideration can put dollars in your pocket . . .

Condensed from Wisconsin Agriculturist

DO cows hold up their milk—or fail to let it down? Actually there's quite a big difference.

Letting down milk is a normal process, although not voluntary, and most cows like it. But there's no way it can be controlled by a cow, any more than breathing or blood circulation.

However, the milk yield may be reduced by nervousness from fright or unusual conditions. When this happens, many dairymen say the cow is holding up her milk. Actually, a hormone secretion has disturbed the natural let down process.

Two hormones are responsible for the amount of milk you get. Stimulants such as washing the udder with warm water, noise of milking equipment or feeding preparations, cause secretion of oxytocin, a "let down" hormone, into the blood stream.

About one minute is required for the hormone to reach the udder where it causes muscles surrounding the milk producing cells to contract. This squeezes the milk out into ducts leading to the teats.

This action generally lasts from 5 to 10 minutes. And milk which is not obtained during this period will be retained in the udder.

But when cows become excited, nervous or suffer pain, another hormone, adrenalin, is secreted. If it gets to the udder first, it causes a constriction of the blood vessels and prevents the let down hormone from acting.

What happens to milk left in the udder? Incomplete milking does reduce milk manufacture by the cow and it may increase mastitis problems in infected cows. Unless accumulated milk is harvested, production will gradually stop.

Regardless of how careful you are, there's always some milk left in the udder. But because of poor milking practices or lack of enough "let down" hormone, additional unharvested milk may re-

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main in the udder.

Here's how you can get full cooperation from your cows and milk you may never have missed:

● Avoid frightening cows just before milking time. Rough handling or loud noises, presence of strangers or barking dogs slows or stops the action of the let down hormone. As a result, you may get only the small quantity of milk that is stored in the cisterns of the teats and glands. Some cows are more sensitive than others.

● Keep your temper under control. Pain caused by kicking or beating can cost you from 5 to 15 pounds of milk. Painful milking caused by sore teats also cuts down production.

If you milk by hand, use a full hand grasp of the teat. Digging with the finger tips or using the thumb knuckle may injure the teat or the pain will interfere with let down of milk.

● Don't expect too much patience from your cows. Minor irritations such as crawling teat cups may lower production of remaining quarters. Make sure all feed is within reach, straining for food during milking may rob you of milk.

● Milk at regular intervals. Going beyond the regular milking time may produce more milk. But the let down response may be over before all of it is removed.

● Train cows to respond to a milking stimulus. Most effective stimulus is a vigorous massage of the teats and udder with a cloth or paper towel, which is wet and warm. But don't delay putting on the teat cups or you may lose the benefit.

Cows which milk slowly or are milked at a slow rate may not milk out completely. Tight teat openings are one cause of slow milkers. If these cows have been milked slow for several months, they may not respond. So give them another chance when they freshen.

● Put easily stimulated cows at the front of the milking line. Milk these cows first. Cows which milk out slowly should be placed at the end of the milking line and milked last.

Remember that cow psychology can be used to relax your cows, raise your production, and put dollars in your pocket.

Use of cattle and poultry manure as a source of plant nutrients and organic matter can mean profits in increased production and decreased fertilizer costs. In general, a ton of dairy manure will be about equal to 100 pounds of 8-4-8 while a ton of poultry manure will equal about 100 pounds of 20-16-8.

The Family Farm And The Future

High costs and taxes make it important that you find the best way to transfer your farm to your heirs . . .

Condensed from Nation's Agriculture

Richard B. Hunt, Doane Agricultural Service

CHANGES now taking place in agriculture are bringing new problems in transferring farm property from one generation to the next.

Land, labor and all the other factors needed in farming cost more and are more complex to manage. Because of the lower margins between costs of production and market prices, today's farmer must market a higher volume of products than in previous years to maintain a satisfactory income.

This situation increases the need for more thought and care in the transfer of family farms and capital. For without a timely and proper transfer of property, many young men will not be able to farm in the future.

Transfer of farm property should be done so as not to cut its efficiency or permit erosion of the estate from taxes.

There are usually 4 major goals which such transfer should strive to meet. These are:

1. Provide reasonable security for the son who is to operate the farm later;
2. Give reasonable security for the parents;
3. Provide for equitable treatment for all heirs; and
4. Keep the farm intact, as a going concern with the basic resources needed to sustain it as an economical, profitable unit.

Basically, farm property transfers which become effective while the parents are still living are one of 3 general types.

A Purchase Arrangement whereby the son buys the property for money, support of the parents or other service. A plan which permits gradual purchases of either physical property or shares of stock representing part interest in the farm unit as a whole may be advantageous for several reasons.

Care should be taken to provide measures to prevent misunderstandings when purchases are made with payment in some

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form other than money, such as support contracts.

A Lease Arrangement is a second form of transfer. The son becomes the farm operator under a rental or income and expense share basis. The son looks to inheritance laws, or will or promise of a will, to provide him a greater interest in the property at a later date.

A rent-plus program can be set up in which additional payments can be made annually to the owner. Under this plan, the owner credits this payment above rent to the tenant (buyer) toward future purchase of the farm. In time, the buyer's equity in the farm builds up to an amount (often ½) that title of the farm is transferred to him. The former owner then takes a mortgage against the farm for the remaining equity, which the younger man continues to pay off annually. These arrangements are often called installment land contracts. Almost 30% of all financed land purchases are of this type.

The human grows more in the first year of life than any other, based on percentage gains.

A Gift is the third method of farm transfer. Under this arrangement, the parents deed the farm property over to the son or other parties. Complete title is transferred. In many instances, only a part of the property is deeded over while the parents are living. The remainder is to be presented as a gift upon death of the parent.

Estate inheritance and gift taxes are an extremely important consideration. These include Federal and various state taxes. Unless care is taken, much of the estate or value of the capital assets being transferred can be taken by these taxes. Whenever a gift is made in contemplation of death by an owner, the law clearly subjects such transfer to an inheritance tax.

Transfers made earlier in the owner's life without regard for inheritance are more desirable, since these gifts will be subject to gift taxes, which are lower in most cases. A person is permitted to give property valued up to $3,000 annually to each child without paying a gift tax on it. In addition, everyone has a lifetime Federal gift tax exemption of $30,000. He may use this to give one or any number of gifts.

The transfer of gifts prior to death also reduces administration and probate costs, since property given away does not have to be administered and probated.

The tax on a sizeable gift made in one sum may be quite heavy. If a plan is started early in the

son's life, repeated small gifts can be made, which will in time transfer a large equity in the property free of gift taxes. Such a program will also provide a gradual shifting of ownership and responsibility, which is often highly desirable. Also, this financial assistance early in the young man's life is during that stage in his life when he will probably be able to benefit from it the most.

However, even large gifts are usually taxed less than the inheritance tax would be on the same property. There are 2 reasons for this.

1. The tax rate on gifts is lower than the rate on inheritances.

2. The gift tax on the first several thousand dollars is computed at rates in the low brackets, and the property is taken out of the high brackets of inheritance tax rates where it would otherwise be taxed.

In planning to make gift transfers, it is well to remember that a gift made within 3 years of death is presumed by law in most states to have been made in contemplation of death, and becomes subject to inheritance and/or estate taxes. Also, depending on individual state laws, gifts made to reduce future inheritance taxes must be complete, and with no strings attached.

There are several organizational structures (ways to manage, or run the home business) which can be used to assist the younger generation in getting started, and will perpetuate family ownership and control of farm property. These include father-son partnerships and family corporations.

The father-son partnership permits the capital assets of the father to join forces with the labor, aggressiveness and technical training of the son. For a legal partnership to exist, all partners must share not only in the net profits, but the expenses as well. The partnership must have a name, only one set of books, a joint bank account and joint management by the partners. Essentially, it is co-ownership of the farm business.

North Carolina has 6,300 high school students driving school buses, and their safety record is better than the 700 adult drivers.

Such an organization does permit the son to assume interest and responsibility in a going farm business. However, there are several factors which may become definite disadvantages from such an arrangement. Under a partnership, there is unlimited liability of all partners for the acts of another partner when he or she is acting under the scope

of partnership business.

Each partner is personally liable for the debts and obligations of the partnership. For this reason, extreme caution should be taken in selecting partners. Upon death of one of the partners, the partnership must be dissolved. Unless proper wills have been developed, the going farm business may become split up into inefficient units.

Another organizational structure which can be used to transfer farm property is the corporation. This sets up a continuing operation. A corporation exists as long as its shareholders desire and the corporation fills the requirements of the law. It can continue to function from one generation to the next, because shares of stock, rather than farmland, livestock and equipment, are passed to the next generation.

Ever wonder what's happened to the old-fashioned girl? Maybe she's at home with her husband?

The owner of a share of stock may sell it, leave it to persons by will or make a gift of it without breaking up the business. Shares of stock also provide a simple way for the oncoming generation to *gradually buy* into the farm business.

Using annual tax-free gifts in connection with stock transfers under a corporation farm structure is a highly desirable method of transfer. The whole farm remains intact. Income-producing stock may go to the parents and all heirs. Taxation is reduced to a minimum. The son operating the farm may either buy or be given increasing equity in the farm through stock transfer. The parents are able to retain equity in the farm, but major operating responsibility can be transferred to the son if desired by electing him manager of the corporation. Income may also be provided through salaries and bonuses paid by the various jobs stockholders perform in the farm business.

When establishing either a partnership or a corporation, several conditions must be met in order to assure success. The farm must be of such size to be able to support the several families of all parties seeking to make a living on it. Also, it is essential that all parties be able to get along with one another. Family quarrels and disputes often hurt efficient operation and can lead only to hardships and possible dissolvement of the business.

Income tax differences should also be considered, as these may vary between the various organizational structures. Under a part-

nership, income tax is paid only on the income received by the individual partners. While under a corporation, income tax is paid by the individuals on their salaries, stock dividends and bonuses, as well as by the corporation on any net profits made.

Of great importance is the 1958 tax law change which now permits a corporation to elect to be taxed out as a corporation. This eliminates double taxation. A setup of this kind is called a "pseudo-corporation." Here is how it works: Corporation stockholders can vote not to be taxed as a corporation. Instead, any corporation profits (income above salaries, bonuses and other operating expenses) become taxable to the stockholders as if the income had been distributed to them in added salaries or bonuses.

Any operating losses of the corporation (incurred when total-income is not sufficient to cover salaries and other operating expenses, and must be paid from corporate savings) would be prorated to stockholders and would be deductible from their income as a legitimate expense. Most family farm and other small corporations can qualify as a "pseudo-corporation." You should check with a competent tax attorney on details.

Here's where such a program should be employed: Any corporation profits under $25,000 are taxed at 30%. A 52% income tax must be paid on profits above $25,000. Therefore, when an individual stockholder's income tax bracket is below this level, total income tax would be reduced if stockholders elected to be taxed as a pseudo-corporation. In some cases, taxes would be lowered even if stockholder tax rates were above those corporate income tax rates.

This new tax regulation makes the corporate organization much more desirable than it was previously. Many will want to incorporate rather than set up a partnership. The income tax rates now become similar to individual or partnership ownership. Liability and other considerations are often much more desirable under a corporation.

There are any number of ways a farm family can turn which will facilitate transfer of farm property. However, legal complications for each of them are such that a competent attorney should always be consulted when planning such moves. It is essential that all parties involved clearly understand all aspects of the method of transfer selected. Final decisions should be worked out and recorded as a legal document for future reference.

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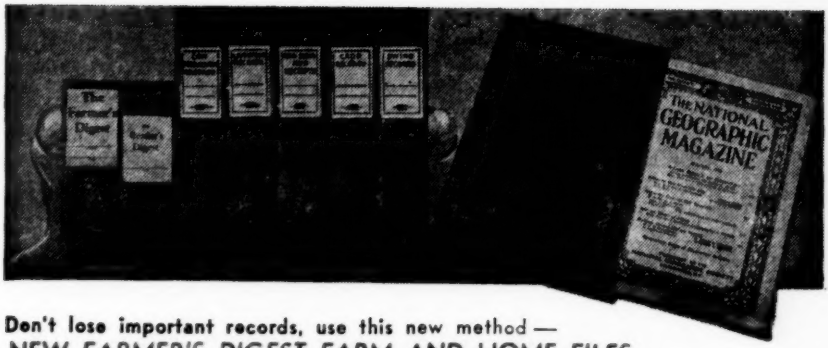

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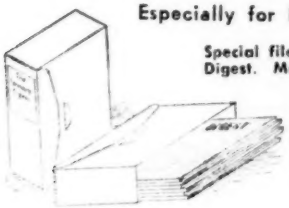

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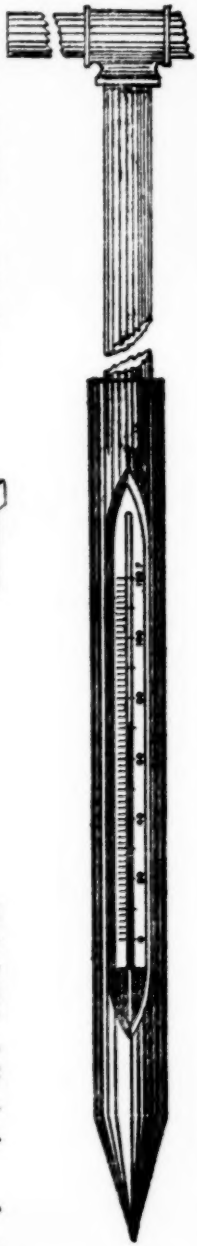

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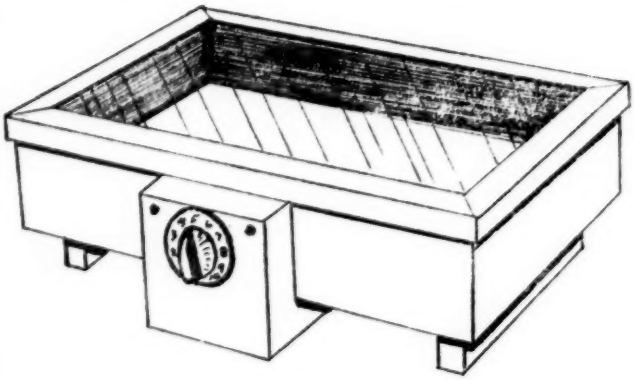

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